Cooperative Learning Lesson Plan

Course: Foods for Life **Unit:** Nutrition (8 – 10 days)
Lesson: Nutrients **Practical Problem:** How do we choose nutritious foods?

Objectives:

1) Identify 6 major groups of nutrients (Cognitive / knowledge)
2) Summarize the 3 main functions of nutrients (Cognitive / Synthesis)
3) Describe how nutrients work together in promoting health (Cognitive / Evaluation)
4) Summarize basic functions and food sources of carbohydrates, fats, proteins, vitamins, and minerals (Cognitive / Synthesis)
5) Identify effects of nutrients on the body (Cognitive / Analysis)
6) Plan a set of meals that demonstrate ways to add food variety and nutrients to your eating plan (Cognitive / Synthesis)

Materials:

- Nutrition and Wellness Textbook (chapters 5 and 6)
- Food for Today textbook (chapter 2)
- Issue Articles from Nutrition and Wellness Issue Resource in teacher tool box
  - Issue # 6
  - Issue # 7
  - Issue # 10
  - Issue # 15
  - Issue # 18
- Computers with internet access
- T-chart examples for teacher
- Poster paper and markers for T-charts
- Nutrient quick sheets
- Help-Me Help-You sheet
- Other materials as directed by students

Introduction (5 min.):

What have we been studying for the past week? (How to make healthy food choices) We have been looking at the reasons we choose the foods that we eat, what the USDA says we should be eating, how different cultures meet their food needs, etc. In doing this, we have been throwing around words like carbs, fat, protein, vitamins, minerals, fiber, etc. However, what is a carbohydrate? Why do we need them? What foods provide them for the body? Can we exist on a carb-free diet? We need to answer these questions, and many more, for each of our terms so that we can fully understand our eating plan or diet.

To do this, we are going to look at the 6 nutrients. What are the 6 nutrients? (Carbohydrates, Fat, Protein, Vitamins, Minerals, and Water) What happened to fiber? Now that we know what the nutrients are, what are other questions you have about the nutrients? Are there different types of fat? Carbohydrates? Protein? What are the different types of vitamins and minerals for? Is it really that important that we get them all? Are supplements (like pills) ok to get us the vitamins and minerals we need?

How many of you enjoy working in groups? I used to dread working in groups for probably some of the same reasons some of you did not raise your hands. I always felt like no one else did their share of the work or they were not paying attention. With that in mind, I like to use a strategy called cooperative learning – other teachers may do it with you and call it group work so that it does not cause confusion.

We are going to use this strategy for the next several days in order to help us learn a lot of information about nutrients, and then share the information with each other in our cooperative groups. It is my belief that you are more likely to learn from each other and hold each other accountable to learn each part. In your groups, you will each choose a nutrient to research. You will become the "expert" on that nutrient. Then you will report back to your cooperative group and you will TEACH them the information.

Teacher Cooperative Strategy Notes:

1. For Cooperative Learning to be effective, you must build "student buy – in."
2. Elements that must be present include:

Positive Interdependence (PI):

- **T** → **Tasks** – division of work so that each person depends on the others
- **I** → **Identity** – group establishes an identity
- **R** → **Resources** – each person has a portion of the materials; they must combine to reach their goal
- **E** → **Environment** – the room/limitations
- **D** → **Duty/Roles** – each person assigned a role that is connected to task

- **F** → **Fantasy** – task given where they must collaborate to survive
- **R** → **Rewards** – group celebrates success
- **O** → **Outside Enemy** – groups placed in competition with each other
- **G** → **Goals** – student can reach goal only if the rest of the group achieves their goals

Individual Accountability (IA):

- The students are motivated to get their work completed with mastery
- Can be done with:
  - Individual random note checks
  - Individual testing / assessment

These elements will be highlighted throughout the lesson plan. Higher rates of success with cooperative learning strategies are usually associated with having as many elements of positive interdependence as possible.

Concepts:

Social Skills

Check for Understanding

Looks Like	Sounds Like
Questioning look on face	Asking "Do you understand/get it?"
Telling the same information 2 times	Asking "Can you tell me what I just said?"
Tilting head when asked a question	Asking specific questions about …
	Asking "Do you need me to repeat that?"

Active Listening

Looks Like	Sounds Like
Leaning forward	Asking "Can you tell that another way?"
Eye contact with speaker	Paraphrasing what the person just said
Nodding head	Asking specific questions about …
Taking notes on what was said	Asking "Can you give me an example?"
Scrunched forehead (thinking look)	Saying " I still don't get it"

Six Nutrients

1. Water
   - VITAL Nutrient
   - Provides 0 calories per gram of water
   - Needed to help body perform many life-supporting activities
     - Carries nutrients in body
     - Eliminates waste
     - Helps regulate body temperature
       - When you get hot, you perspire and the evaporated air cools your body
   - You can live several weeks without food, but only several days without water
   - Your body is 65% water!
   - Your blood is 80% water!
   - Each day our bodies lose 2 – 3 quarts or water. To replace it, you need to drink 2 quarts or 8 cups of fluids each day
   - Sources of water
     - Plain water
     - Juices, milk, and soups
     - Many foods – fruits, vegetables, breads, and meat may supply a small amount of water
       - Watermelon is over 90% water!
   - Beverages with caffeine (soda, tea, coffee) are NOT good sources because caffeine takes water out of the body

2. Fat
   - Fat is both a food and a nutrient
   - As a food, it gives your meals texture and flavor, it also slows down the digestive system, helping you feel full longer
   - As a nutrient, it supplies energy and has other important roles in the body such as:
     - Provides 9 calories per gram of fat = energy
     - Promotes healthy skin and normal growth

- Acts as a partner with certain vitamins – carrying them to wherever they body needs them (Vitamins A, D, E, and K)
- Cushions vital organs such as the heart and the liver

- Fat is divided into two major categories:
  - Saturated
    - hard at room temperature
    - examples: stick of butter / margarine, fats in meal, poultry, and dairy products
  - Unsaturated
    - liquid at room temperature
    - examples: vegetable oils, nuts, olives, and avocados
- Cholesterol
  - a waxy substance that is part of every cell in your body (it is not a fat!)
  - a high level of cholesterol in your blood increases your risk for heart problems
  - your body PRODUCES cholesterol and it also obtains it from food
  - cholesterol is found in foods from animal sources: meat, poultry, fish, egg yolks, and dairy products
  - foods from PLANT sources have NO cholesterol (example - nuts)
  - If you have high blood cholesterol, you need to change your diet so it is low in cholesterol (which usually means low in saturated fat food sources)
- Food Sources of Fat
  - naturally present in meat, poultry, fish, nuts, and dairy products
  - vegetable oil is a liquid form of fat – used to fry foods
  - Butter, margarine, cream, and mayonnaise are almost all fat
    - these sources of fat are almost always found in salad dressings, gravy, cookies, cakes, ice cream, etc..

3. <u>Vitamins</u>
   - Provides 0 calories per gram
   - only needed in small amounts but they are essential to the body because:
     - they build body tissue, help regulate body processes, and help other nutrients do their jobs
     - the body can not produce energy without vitamins
   - two major categories of vitamins:
     - fat soluble
       - vitamins A, D, E, and K
       - dissolve in fat
       - are stored in body fat and the liver for later use
       - eating too much of them can be harmful to the body (toxic)
     - water soluble
       - vitamins C and B
       - dissolve in water
       - are not stored in the body, so you need to replenish them
       - excess is excreted in the urine (too much is not good, because it causes the kidneys to work too hard to remove them

Fat Soluble Vitamin

Vitamin A
- promotes growth and healthy skin and hair
- helps eyes adjust to darkness
- helps body resist infections

Examples of food sources:
Dairy products
Dark, leafy green vegetables (spinach)
Deep yellow orange fruits and vegetables (carrots, pumpkin, winter squash, cantaloupe, peaches, and apricots)

Vitamin D
- helps build strong bones and teeth
- enhances calcium absorption

Examples of food sources:
Fortified milk
Egg yolks
Fatty fish (salmon and mackerel)
Liver
* Body produces Vitamin D from sunlight

Vitamin E
- protects other nutrients from damage
- helps form red blood cells and muscles

Examples of food sources:
Vegetable oils
Whole grain breads and cereals
Dark green, leafy vegetables
Dry beans and peas
Nuts and seeds

Vitamin K
- helps blood clot

Examples of food sources:
Dark green, leafy vegetables
Wheat bran and wheat germ
Some fruits
Egg yolks
Liver

Water Soluble Vitamin

Vitamin C (Ascorbic Acids)

- Increases resistance to infection
- Maintains healthy teeth and gums
- Helps wounds heal
- Helps keep blood vessels healthy

Examples of food sources:

Citrus fruits (oranges, grapefruit)
Cantaloupes
Tomatoes
Green peppers
Strawberries
Kiwi
Mangoes
Potatoes
Broccoli
Cabbage

Vitamin B

Types of B vitamins include:

*Thiamin
*Riboflavin
*Niacin
*Vitamin B12
* Folic Acid (Folate)

- Helps in energy production
- Maintains healthy nerves
- Helps resist infection
- Helps rebuild red blood cells
- Helps prevent birth defects (folic acid)

Examples of food sources:

Enriched and whole grain breads and cereals
Fruits and vegetables
Dairy products and eggs
Lean pork, meat, poultry, and fish
Dry beans, peas, and nuts

- a third category is antioxidant (combines vitamins from the two groups above)
  - An antioxidant helps protect the body from cell damage that can lead to health problems
  - Vitamins A, C, and E are also antioxidants
  - Food sources include: fruits, vegetables, whole grain breads and cereals, and nuts

4. Minerals
   - Provides 0 calories per gram
   - Promote good health while regulating body processes AND becoming part of bones, teeth, and blood
   - Divided into 3 groups:
     - Major Minerals
       - Needed in relatively large amounts
       - Calcium, phosphorus, and magnesium

- Electrolytes
  - Specific major minerals that work together to maintain the body's fluid balance
  - Potassium, Sodium, and Chloride
- Trace Minerals
  - needed in very small amounts, but they are just as important as the other minerals
  - Iron, Zinc, Copper, Iodine and Selenium

- Need to pay attention while you are in your teenage years in order to have strong bones and healthy blood in the future
  - Healthy Bones
    - Your bones need calcium, phosphorus, and magnesium to grow
    - Your need is highest for these minerals when you are in your teen years and building bone while trying to maintain what you already have
    - If you do not get enough of these minerals, then your body will withdraw what it needs, which will lead to osteoporosis
    - Osteoporosis is a condition in which bones become porous and break easily
  - Healthy Blood
    - Iron helps red blood cells carry oxygen to all parts of your body
    - Without it = anemia, a condition that makes you feel tired and weak
    - Females need more iron due to the loss of iron and the extra need in the female reproduction systems; therefore, women are at higher risk for anemia

Mineral

Calcium
- Builds and renews bones and teeth
- Regulates heartbeat, muscles, and nerves

Examples of food sources:
Milk, yogurt, cheese
Dark green, leafy vegetables
Canned fish with edible bones
Dry beans
Calcium-fortified juices and cereals, etc.

Phosphorus
- Helps in energy production
- Builds and renews bones and teeth

Examples of food sources:
Milk, yogurt, cheese
Meat, poultry, fish, egg yolks
Whole grain breads and cereals

Magnesium
- Builds and renews bones and teeth
- Helps nerves and muscles work properly

Examples of food sources:
Whole grain products
Dark green, leafy vegetables
Dry beans and peas
Nuts and seeds

Sodium, Chloride, and Potassium
- Help maintain the body's balance of fluid
- Help with muscle and nerve action

Examples of food sources:
Sodium and Chloride: Salt and foods that contain salt
Potassium: Bananas, grapefruits, and other fruits; vegetables, meat, poultry, fish, dry beans and peas, dairy products

Iron
- Helps build and renew hemoglobin to carry oxygen to cells

Examples of food sources:
Meat, poultry, fish, dairy products
Dry beans and peas
Dark green, leafy vegetables
Dried fruits
Enriched grain products

Zinc
- Helps heal wounds and form blood
- Helps in growth and maintenance of body tissues

Examples of food sources:
Meat, liver, poultry, fish
Dairy products
Dry beans and peas
Whole grain breads and cereals
Eggs

Fluoride
- Helps prevent decay by strengthening teeth

Examples of food sources:
Small amounts added to water by community
Toothpaste

Selenium
- Helps your heart work properly
- Antioxidant?

Examples of food sources:
Whole grain breads and cereals
Vegetables (depends on soil)
Meat, organ meats, fish, shellfish

Iodine
- Responsible for body's use of energy

Examples of food sources:
Saltwater fish
Iodized salt

5. Protein
   - Helps your body grow, repair itself, and fight disease
   - Provides 4 calories per gram of protein if needed

- If you eat too much protein, then your body stores the extra calories as body fat. Eating more protein than you need will not trigger the body to build bigger muscles – only physical activity does that – which, in turn, requires you to need more protein to repair muscles
- Amino acids are the many small units that make up protein (similar to the notes in music – the same notes make up a song or symphony, it just depends on how they are arranged; another example to use would be the letters of the alphabet – they can be rearranged to spell out different words)
- There are 22 known amino acids
- Your body arranges amino acids to make the different proteins needed
- Amino acids are broken down into 2 groups:
  non-essential – amino acids your body can make (13 amino acids are in this group)
  essential – amino acids your body can not make that MUST come from the food you eat (9 of the amino acids fall into this category)
- Proteins are divided into 2 groups:
  - Complete Protein
    - A protein source that has ALL 9 essential amino acids needed by the body; usually ALL animal sources are complete proteins
  - Incomplete Protein
    - A protein source that does NOT have all the essential amino acids needed by the body; usually, plant sources are incomplete proteins. HOWEVER – if the right combination of incomplete proteins is eaten together (or in the same 12 hour period) they would make a complete protein. Example – Black beans and rice or a peanut butter and jelly sandwich.
- Food sources of protein
  - Animal Sources
    - Meat, poultry, fish, eggs, and dairy products = complete proteins
  - Plant Sources
    - Dry beans, peas, and nuts
    - Grains have a little protein, but not much

6. <u>Carbohydrates</u>
   - Body's main source of energy
   - Provides 4 calories per gram of protein
   - Generally, they are the least expensive form of energy (compared to protein and fat)
   - If you skip meals or limit carbohydrate intake, your body may run short on energy and have to pull from the protein or fat and then they can not do their specialized jobs
   - If you eat more carbohydrates than you need, you may get more calories than you need, which the body then stores as fat
   - Grouped into 2 categories:
     - simple
       - sugars are simple because they are made of one or two sugar units
     - complex
       - Broken down into 2 sub categories: starches and dietary fiber
       - **Starches** are complex because they are made up of many sugars all attached together
       - During digestion, starches break down into single sugars, which are then taken by the body and used for energy
       - Most foods that are high in complex carbohydrates are also good sources of fiber
       - **Dietary fiber** is a plant material that can not be digested
       - Dietary fiber can be broken down into 2 categories: soluble fiber and insoluble fiber

- Soluble Fiber dissolves in water and increases the thickness of the stomach contents (oat products, beans, etc..)
- Insoluble Fiber does not break down, but absorbs water and becomes bulky. This bulk is what produces regular bowel movements (whole wheat grain products, vegetable / fruit skins)
- It helps your digestive track work properly and may help protect your body from heart disease and cancer.

- Food sources of carbohydrates
  - Simple sugars are natural parts of some foods
    - example – fruit (fructose), grains (maltose), milk (lactose)
    - the most widely used sugar is sucrose or table sugar – from sugar cane or sugar beets
    - these foods also carry other important nutrients, such as vitamins
  - Sources of complex carbohydrates are:
    - whole wheat grain products, rice, breads, pasta
    - vegetables such as squash, potatoes, corn
    - dry beans, peas, and lentils

Implementation of Strategy:

Phase 1: Prepare for Cooperative Learning Tasks

- This is done by proof of the lesson plan – this stage is when the teacher makes the decisions on how the strategy will look
- Teachers may want to use a Teacher Decision Sheet or a brief outline of details in order to remember where to direct the students' attention during the lesson
- Elements that are not easily visible in this lesson include:

  - Goal – If each student reads, studies, and explains their topic thoroughly to the rest of the group, then each group member will be successful at mastery learning. With mastery of the content, they will do well during the review and assessment portion of the lesson.

  - Fantasy – They must all work together to get a passing grade on the assessment. This could be developed if you wanted to add a Survivor component.

Phase 2: Structure of Cooperative Learning Experience

Day 1

- Social Skills
  - Use chart paper to create T-charts for the two social skills: "Active "Listening" and "Checking for Understanding."
  - Ask students: Why is it important to practice active listening skills? What about checking for understanding?
    - Connect social skills with miscommunication problems they may have with parents (over chores, money, etc.) or with teachers (not paying attention, but they "are") and miscommunications with friends.
  - Use an example to get students started with what it looks like and sounds like, then, have students provide the rest of the examples.
  - Use the Teacher Decision Sheet to ensure that the elements you want included are stated.
  - Explain how the teacher observation of these social skills will work – (use observation sheet)
    - Decide if you will do this on a 10-minute rotation, or some other method of observation
    - Set goal for each social skill
      - Each group should have each student displaying at least 1 trait of each social skill
    - For each group that has each member displaying at least 1 of each social skill, I will allow that many minutes of open notebook testing toward the end of the testing period (PI / Reward)
- Organize Groups
  - Have students count off by 4's. As they say their numbers, give them a Nutrient Quick Sheet that corresponds with their number.
  - Assign the following nutrients to the student with that number (PI / Roles):
    1. Vitamins
    2. Minerals
    3. Carbohydrates
    3. Water
    4. Protein
    4. Fats

- Then have students get into groups of 4 by choosing partners that have a 1, 2, 3, or 4. Example – if I am a "2", then I want to look for partners that have a 1, 3, and 4.
  ** *They can only have one person from their previous table group in this new group.*
- Once in groups, have them write each other's names on their papers so they do not forget what "cooperative" group they are in.
- Each "cooperative" group will be designated an area of the room that is their meeting space. In this area they are to leave their collected resources and team folder (PI / Environment)
- Use cooperative starter questions to get the students talking and telling each other about themselves (establishes a supportive, trusting environment):
  - What do you know about the nutrient you have?
  - How do you learn best?
  - What can we do as a group to help each other learn the material for the final test?
- Once student introductions are completed, students will need to complete the following tasks:
  - Create a team name / identity (PI / Identity)
  - Decorate their team folder (PI / Identity)
  - Time permitting, they could even create a team banner to place in their designated area (PI / Environment)
  - Assign the following roles (PI / Roles):
    1. *Presenter – presents their information
    2. *Time keeper – makes sure group stays on topic to complete all tasks on time
    3. *Social skills checker – monitors to make sure everyone is actively listening and checking for understanding
    4. **Resource manager – collects materials on a daily basis and stores folder in designated area

    * Roles 1, 2, and 3 will rotate during the days the cooperative group shares their information to each other

    ** Role 4 will begin today, and will be responsible each day to make sure each member's information gets put back into their team folder.

Day 2

- Post unit objectives on poster paper on a visible area so all students can see them
  - Review with students the academic and the interpersonal objectives
  - T-Charts should also be located in this same area

- Pass out materials to each member of the group that correspond with their number (PI / Task)
  - Teacher asks:
    - Why do you think I have divided all the information for these chapters among each of your group members?
    - Answer looking to develop is: so that the division of information forces each of you to rely on the rest of the group to learn the information and to meet the various goals we will set
    - This verbal discussion will increase buy-in; if it is just stated, the buy-in may not be as strong to begin the lesson
- NOTE: one set per group so they must develop a sense of positive interdependence – reinforces task division if they do not have all the information
  - Textbooks (Nutrition and Wellness chapter 5 and 6 and / or Food for Today chapter 2)
  - Other handouts as necessary

- Use Issues resource in teacher textbook box of Nutrition and Wellness textbook
  - Issue # 6
  - Issue # 7
  - Issue # 10
  - Issue # 15
  - Issue # 18
- Have student move to their "expert" group
  - NOTE: even though this group is temporary, time spent to develop a sense of "team" is helpful in the end to reach the academic objective
  - Students may select to make a certain part of the room or area theirs (PI)
  - Students need to:
    - Use this time to have students talk about what they plan on doing while they are reading to record the information for themselves and their cooperative group – will I only fill out the form the teacher provided, or will I take notes? Does on person want to concentrate on one specific area?
    - Each person reads the guided notes in packet
    - As a group, review the guided notes in their packet to make sure everyone understands what information is needed
    - While working, each student should:
      - Take notes, examples of foods that have nutrients, and chart – especially for vitamins and minerals to show sources and what they are used for by the body
- Students have the rest of the class time to start reading and researching their nutrient

Phase 3: Monitor Group Interaction

Day 3

- Students should spend class time reading materials and creating notes that will allow them to teach to their cooperative groups
- Teacher moves from person to person to ensure they are understanding what they are reading and picking up the main points

Day 4

- Students have 10 minutes to review their information, or to finish any necessary reading or research
- In expert groups, have students assume the following roles (PI / Roles):
  - Presenter – presents their information
  - Time keeper – makes sure group stays on topic to complete all tasks on time
  - Cross checker – cross-check guided notes sheet and quick notes to make sure all information is presented
  - Social skills checker – monitors to make sure everyone is actively listening and checking for understanding
- Review material they read, make sure they have examples and can talk about the material without reading notes directly
- Teacher will:
  - Use observation sheet to monitor group and individual work
  - Give feedback on social skills for the group and individual
- Have students sign each other's notes stating that the person (whose notes you are signing) helped create the notes AND they are able to explain them to the group (PI / Task)
- Teacher may collect any expert group member's notes to be graded for the entire group. Use random name selection (example - names on popsicle sticks) (IA)

- In expert groups, have students write 5 – 7 questions that would be on a test. These are to be included in final assessment.
  - Each person in the group signs the question sheet to indicate that they can explain AND answer the questions developed by the group
- Have students move back to cooperative groups and begin sharing the material they learned about their nutrient
  - Again, teacher may collect any group member's notes to be graded for the entire group. Use random name selection (example - names on popsicle sticks)

Day 5

- Return and have groups continue reporting out their information regarding their nutrient
- When done reporting out, groups should use this time to:
  - Quiz and check each other's understanding of the material each person presented
  - Determine how well they made sure everyone is learning
  - Develop mnemonics to remember their information
  - Continue guided notes outline (if needed)

Day 6

- Nutrient Ball Toss Review
  - Have students get into cooperative groups – toss ball in game format – keep score of who gets the most correct answers
  - Key to game is that each member must answer a question correctly before any other member of the group tries to answer a question (after having already answered one correctly) (IA)

*EVERY group that has everyone in their group participate with at least 1 correct answer will get 2 bonus points on their test score (PI / Reward)

** During the Nutrient Ball Toss, the team that gets the highest number of points with each team member answering a question correctly will get to use their notes for an additional 10 minutes during the day of testing (PI / Outside Enemy)

Other ways to push for IA would be to use popsicle sticks and to randomly call on students to answer questions

Phase 4: Evaluation and Reflection

Day 7

- Test using students' questions as well as teacher's (a combination of the two)
- Include any open-notebook minutes as earned by observation sheet records

Day 8

- Have students get into cooperative groups, and then have them get into pairs from this foursome.
- Each student pair gets a COPY of their answer sheet returned to them and they correct their tests using no notes, and they must agree on the final corrected answers.
- They return to their cooperative group and as a group they go through the answers – creating a final answer sheet that each member must agree on AND be able to explain/support their new answers. Teacher can do this check randomly by calling on a group member to support their team's answer (again, use popsicle sticks with students' names already on them to randomly select a student) (IA). At this point, they may use the materials they created and the resources provided during the research segment of the activity
- Each group turns in a final answer sheet.
- Each cooperative group that gets a score of 95% or better on the group answer sheet will receive 5 bonus points on their individual test score (PI / Reward)

Closing/Generalizations:

- Have students complete the Help Me – Help You worksheet
- Use the following questions to connect and guide classroom discussion regarding curriculum:
  - How does the information each group learned about the nutrients connect to the Dietary Guidelines we learned about last week?
  - Some people said that now they know about the nutrients, it will help them eat better. How do you plan on applying the information about nutrients to your current diets / eating plans?
  - Describe how connecting the dietary guidelines and the nutrient information will help you when you have a family and children of your own – or the next time you are babysitting.

Assessment:

- Observation of answers during closing / debriefing
- T-Chart observations of group interactions
- Expert group review with teacher
- Nutrient test done individually, corrections done in cooperative groups
- Help me – Help you responses

Cooperative Learning
Teacher Decision Sheet

1. Social skills to observe

Check for Understanding

Looks Like	**Sounds Like**
Questioning look on face	Asking "Do you understand/get it?"
Telling the same information 2 times	Asking "Can you tell me what I just said?"
Drawing or writing an explanation	Asking specific questions about …
Tilt of head as person explains	Asking "Do you need me to repeat that?"
Watch person's body posture	Asking "Can you give me an example of…?"

Active Listening

Looks Like	**Sounds Like**
Leaning forward	Asking "Can you tell that another way?"
Eye contact with speaker	Paraphrasing what the person just said
Nodding head	Asking specific questions about …
Taking notes on what was said	Asking "Can you give me an example?"

Guided Notes:

Water

- ___Vital_____ Nutrient
- Provides __0___ calories per gram of water
- Needed to help body perform many life supporting activities
  - Carries nutrients in the body
  - Eliminates waste
  - Regulates body temperature
    - When you get hot, you perspire and the evaporated air cools your body
- You can live several weeks without food, but only several days without water.
- Your body is __65%___ water!
- Your blood is ___80%_____ water!
- Each day our bodies lose __2 - 3_____ quarts or water.
  - To replace it, you need to drink __2__ quarts or __8___ cups of fluids
- Sources of water
  - Plain Water
  - Milk
  - Juice
  - Sports drinks
  - Many foods – examples are __fruit____ and ____vegetables____
    - Watermelon is over __90%__ water!
- Beverages with _____caffeine_____ (soda, tea, coffee) are NOT good sources because caffeine takes water __out__ of the body

Fat

- Fat is both a ____food_____ and a ___nutrient_____
- As a food, it gives your meals ___flavor_____ and ____texture___
  - Fat also slows down the digestive system, helping you feel full longer
- As a nutrient, it supplies __energy__ and has other important roles such as:
  - Provides _9_ calories per gram of fat = energy
  - Promotes healthy __skin_ and normal growth
  - Acts as a partner with certain vitamins – carrying them to wherever the body needs them (A, D, E, and K)
  - __Cushions___ your vital organs, such as the heart and the liver
- Fat is divided into two major categories:
  - _Saturated__
    - are __hard____ at room temperature
    - examples: stick of butter / margarine, fats in meal, poultry, and dairy products
  - _Unsaturated__
    - are _liquid_____ at room temperature
    - examples: vegetable oils, nuts, olives, and avocados
- Cholesterol
  - A _waxy__ substance that is part of _every_ cell in your body (it is not a fat!)
  - A high level of cholesterol in your blood ____increases_ your risk for heart problems
  - Ways to get cholesterol
    - Your body __produces_ cholesterol
    - It also obtains it from food
  - Cholesterol is found in foods from _animal_ sources:
    - Examples: meat, poultry, fish, egg yolks, and dairy products
  - Foods from PLANT sources have _NO_ cholesterol
    - Example: nuts

- If you have high blood cholesterol, you need to change your diet so it is low in cholesterol (which usually means low in saturated fat food sources)

- Food Sources of Fat
  - Naturally present in meat, poultry, fish, nuts, and dairy products
  - vegetable oil is a liquid form of fat – used to fry foods
  - Butter, margarine, cream, and mayonnaise are almost all fat
    - These sources of fat are almost always found in salad dressings, gravy, cookies, cakes, ice cream, etc.

Vitamins

- Provides _0_ calories per gram
- Only needed in _small__ amounts but they are __important__ to the body because:
  - They build body tissue
  - They help regulate body processes
  - They help other nutrients do their jobs
  - The body can not produce _energy_ without vitamins
- Two major categories of vitamins
  - __Fat__ soluble
    - Vitamins A, D, E, and K
    - Dissolve in __fat__
    - Are stored in _fat____ and the __liver__ for later use
    - Eating too much of them can be harmful to the body (toxic)

Vitamin	Function	Food Source
A	Promotes growth and healthy skin and hair Helps eyes adjust to darkness Helps body resist infections	Dairy products Dark leafy green vegetables Example: _spinach___ ____Deep yellow / orange fruits and vegetables___ Examples: carrots, pumpkin, winter squash, cantaloupe, peaches, and apricots
D	Helps build strong bones and teeth Enhances calcium absorption	Fortified _milk__ Egg _yolks__ _Fatty__ __fish_ Examples: salmon and mackerel _Liver__ ** Body produces Vitamin D from sunlight
E	Protects other nutrients from damage Helps form red blood cells and muscles	Vegetable oils Whole _grain_ __breads_ and cereals _Dark_ _green_ _leafy_ vegetables Dry beans and _peas_ Nuts and seeds
K	Helps blood clot	Dark green, leafy vegetables Wheat bran and wheat _germ_ Some fruits Egg _yolks__ __Liver__

- __Water_ soluble
  - Vitamins __C__ and __B___
  - Dissolve in __Water__
  - Are not stored in the body, so you need to replenish them
  - Excess vitamin is excreted in the urine
    - Too much causes the kidneys to work too hard

Vitamin	Function	Food Source
C (Ascorbic Acids)	Increases resistance to _infection__ Maintains healthy _teeth_ _and__ _gums_ Helps wounds heal Helps keep blood vessels healthy	_Citrus__ fruits oranges, grapefruit Cantaloupes _Tomatoes__ _Green_ __Peppers__ Strawberries _Kiwi__ Mangoes _Potatoes_ Broccoli Cabbage
B Other names: *Thiamin *Riboflavin *Niacin *Vitamin B12 * Folic Acid (Folate)	Helps in _energy__ __production__ Maintains healthy _nerves Helps resist __infection_ Helps rebuild _red_ _blood_ _cells_ Helps prevent _birth_ _defects_ (folic acid)	Enriched and whole grain _breads__ and _cereals__ _Fruits_ and _Vegetables_ Dairy products and eggs Lean pork, meat, poultry, and fish Dry _beans_, __peas_, and _nuts_

- Third category is __antioxidant___
  - Combines vitamins from the two groups above
  - An antioxidant helps __protect__ the body from cell _damage__ that can lead to health problems
  - Vitamins _A_, __C_, and _E_ are also antioxidants
  - Food sources include:
    - Fruits
    - _Vegetables__
    - Whole grain __breads__ and __cereals__________
    - Nuts

Minerals

- Provide _0_ calories per gram
- Promote good health while regulating body processes AND becoming part of __bones_, _teeth__, and __blood__
- Divided into 3 groups:
  - __Major_ Minerals
    - Needed in relatively __large_ amounts
    - Calcium, phosphorus, and magnesium
  - __Electrolytes__
    - Specific major minerals that work together to __maintain__ the body's __fluid__ balance
    - Potassium, Sodium, and Chloride
  - __Trace_ Minerals
    - Needed in very __small__ amounts, but just as important as the other minerals
    - Iron, Zinc, Copper, Iodine and Selenium
- Healthy bones
  - Your bones need _calcium_, _phosphorous___, and ___magnesium__ to grow
  - Your need is highest for these minerals when you are in your __teen__ years

- You are trying to __build__ bone while maintaining what you already have
- If you do not get enough of these minerals, then your body will withdraw what it needs, and it will lead to osteoporosis
- __Osteoporosis_ is a condition in which bones become __porous__ and _break__ easily

- Healthy Blood
  - Iron helps red blood cells __carry__ __oxygen_ to all of your body
  - Without it, a condition called __anemia_ occurs
    - This condition makes you tired and weak
  - Females need more iron due to the ____loss_____ of iron and extra need in the female reproduction systems.
    - Therefore, women are at __higher_ risk for anemia

Mineral	Function	Food Source

Calcium	• Builds and renews __bones_ and _teeth_
	• Regulates
	  - Heartbeat
	  - Muscles
	  - Nerves
		• Milk, yogurt, cheese
		• Dark _green_, _leafy__ _vegetables__
		• Canned fish with edible _bones
		• Dry _beans_
		• Calcium fortified _juices_ and _cereals_, etc..

Phosphorus	• Helps in __energy__ production • Builds and renews _bones_ and _teeth_	• Milk, yogurt, cheese • Meat, poultry, fish, egg yolks • Whole grain breads and cereals
Magnesium	• Builds and renews _bones_ and __teeth_ • Helps nerves and muscles work properly	• Whole grain products • Dark green, leafy vegetables • Dry beans and peas • Nuts and seeds

Sodium, Chloride, and Potassium	Help maintain the body's _balance__ of _fluid_ Help with muscle and nerve action	Sodium and Chloride: Salt Foods that contain salt Potassium: _Bananas__ Grapefruits Vegetables Meat, poultry, fish, Dry _beans_ and _peas_ _Dairy_ _Products_
Iron	Helps build and renew _hemoglobin_ to carry oxygen to cells	Meat, poultry, fish _Dairy_ products Dry beans_ and _peas Dark _leafy_, green vegetables Dried fruit_ Enriched _grain_ products
Zinc	Helps heal wounds Forms blood cells Helps in growth and maintenance of _body_ __tissues_	Meat, liver, poultry, fish _Dairy_ products Dry _beans_ and _peas_ Whole grain __breads_ and __cereals_ _Eggs_
Fluoride	Helps prevent __decay_ by strengthening teeth	__Small_ amounts added to water by community _Toothpaste_
Selenium	Helps your _heart_ work properly Antioxidant?	Whole grain _breads_ and _cereals_ Vegetables (depends on soil) Meat, organ meats, fish, shellfish

Iodine	Responsible for body's use of __energy_	Saltwater __fish_ _Iodized_ salt

Protein

- Helps your body
  - _Grow_
  - _Repair_ itself
  - _Fight_ disease
- Provides _4__ calories per gram of protein
  - If you eat too much protein, then your body stores the __extra__ calories as _fat__.
  - Eating more protein than you need will _NOT_ trigger the body to build bigger muscles
    - only _Physical_ activity does that – which in turn requires you to need more protein to repair muscles
- Amino acids are the __many___ __small__ _units_ that make up protein
  - Similar to the notes in music – the same notes make up a song or symphony - it just depends on how they are arranged
  - Another example to use would be like the letters of the alphabet – they can be rearranged to spell different words
- There are _22_ known amino acids
- Your body arranges amino acids to make the different proteins needed
- Amino acids are broken down into _2_ groups
  - _Non-essential___ – amino acids your body can make
    - ___13__ amino acids are in this group
  - ___Essential_____ – amino acids your body can not make that MUST come from the food you eat
    - ___9__ of the amino acids fall into this category
- Proteins are divided into __2__ groups:
  - _Complete__ Protein
    - Has ALL 9 essential amino acids needed by the body
    - Usually ALL _animal_ sources are complete proteins

- __Incomplete_ Protein
  - Does _NOT__ have all the essential amino acids needed by the body
  - Usually ___plant___ sources are incomplete proteins.
    - HOWEVER – if the right combination of incomplete proteins are eaten together = complete protein
    - Examples – black beans and rice or a peanut butter and jelly sandwich.

- Food sources of protein
  - __Animal__ Sources
    - Meat, poultry, fish, eggs, and dairy products = complete proteins
  - __Plant_ Sources
    - Dry _beans_, __peas_, and __nuts_
    - _Grains_ have a little protein

Carbohydrates

- Body's _main__ ___source__ of energy
- Provide __4_ calories per gram of carbohydrate
- If you _skip_ meals or _limit__ carbohydrate intake, your body may run ___short_ on energy
  - Body will pull from the protein or fat and then they can not do their specialized jobs
- If you eat __more_ carbohydrates than you need, you may get more ___calories__ than you need, which the body stores as _fat__
- Generally they are the _least__ expensive form of energy
- Carbohydrates are grouped into __2_ categories:
  - _Simple_
    - Sugars are simple because they are made of __1_ or __2_ sugar units
  - __Complex_
    - Broken down into _2__ sub categories: _Starches_ and __Dietary__ __Fiber__

- **Starches** are complex because they are made up of __many__ sugars all attached together
  - During digestion, starches _break down__ into _simple_ sugars
  - Used for __energy__
  - Most foods that are __high_ in _complex__ carbohydrates are also good sources of _dietary_ _fiber
- **Dietary fiber** is a plant material that can not be digested
  - Dietary fiber can be broken down into _2_ categories: _soluble__ fiber and _insoluble_ fiber
  - _Soluble__ _fiber__
    - Dissolves in _water_
    - Increases the _thickness_ of the stomach's contents
    - Examples: oat products, beans, etc.
  - _Insoluble_ _fiber_
    - Does _NOT_ break down
    - Absorbs __water__ and becomes _bulk_
    - Produces regular _bowel__ movements
    - Examples: whole wheat grain products, vegetable / fruit skins
  - Fiber helps your __digestive_ track work properly and protect your body from _heart_ disease and cancer

- Food sources of carbohydrates
  - Simple sugars are __natural_ parts of some foods
    - Example –
      - In <u>fruit</u> the sugar is __fructose__
      - In <u>grains</u> the sugar is __maltose__
      - In <u>milk</u> the sugar is __lactose___

- The most widely used sugar is __sucrose__ or table sugar – from _sugar_ _cane_ or __sugar_ __beets_
- These foods also carry other important nutrients – such as _vitamins_

- Sources of complex carbohydrates are:
  - _Whole_ __wheat_ grain products, rice, breads, pasta
  - _Vegetables_ such as squash, potatoes, corn
  - Dry beans, peas, and lentils

Quick Sheet – This is a beginning list of questions that you should be able to ask your expert member. Remember, each set of questions is just the beginning – try to develop new questions and share them with the class by writing them on the board.

Vitamins

What is a water soluble vitamin? Can you give an example of what the vitamin is (both its name and the food it is found in)? Is it dangerous in large amounts? Why or why not?

What is a fat soluble vitamin? Can you give an example of what the vitamin is (both its name and the food it is found in)? Is it dangerous in large amounts? Why or why not?

Why is vitamin C important? What is it found in?

Why is vitamin B important? Does more than one B vitamin exist? Are they different? How? What is it found in?

Why is vitamin D important? What is it found in?

Why is vitamin K important? What is it found in?

Why is vitamin A important? What is it found in?

Why is vitamin E important? What is it found in?

What are antioxidants?

Minerals

What are major minerals? Give examples of what they are and where they are found.

What are electrolytes and why are they important? Give an example of what it is and where it is found.

What are trace minerals? Give an example of what it is and where it is found.

Why is calcium so important?

Can you explain osteoporosis?

Water

Why is water important? What does it do for the body?

What are good sources of water? How can foods be a source of water?

Are drinks with caffeine in them good sources of water? Why or why not?

Fat

What is fat? Where does it come from? How does the body use excess fat?

What is the difference between fat and cholesterol?

Can I get rid of cholesterol from my diet?

What is a saturated fat? Give an example.

What is an unsaturated (also known as a polyunsaturated or monounsaturated) fat? Give an example too.

Which type of fat is better for you? Why?

What is hydrogenation? Why is this important?

Why is fat essential to your health?

Protein

How does the body use proteins? Why are proteins important to the body?

Where are they found?

What are amino acids?

- What does it mean to be an essential amino acid?
- What does it mean to be a nonessential amino acid?

What is an incomplete protein?

What is a complete protein?

Carbohydrates

What is a carbohydrate used for in the body?

Where are they found?

What happens if you do not eat enough carbohydrates?

What are complex carbohydrates?

What is dietary fiber? Why is it important to the body?

- What is insoluble fiber?
- What is soluble fiber?

What is a simple sugar?

Observation Sheet

Group / Student	Social Skill: *Active Listening*	Social Skill: *Checking for Understanding*	Social Skill:

HELP ME – HELP YOU!

Below are several questions to help me plan for our next several chapters. Please answer them giving me as many specific details as possible.

1. Finish this sentence: One thing I learned doing this activity was….

2. How will this "thing" you learned during the activity help you later (either in this class, school, life, etc.)

3. If you had to divide a dollar amongst your group members based on how much work they contributed to your goal, how would you divide it?

   (Example – if you think everyone did equal amounts of work, you would give each person 25 cents)

4. Use the space below to tell me the +'s (things you liked about the class activity done over the past several days) AND the △'s (changes that need to be made to help you be more successful next time)

+	△

Name _____

Nutrient Test

Correct Multiple Choice, Completion, and Matching Responses are worth 1 point each. Correct responses to question number 34 are worth 3 points, and correct responses to question number 35 are worth 4 points.

Multiple Choice

Identify the letter of the choice that best completes the statement or answers the question.

____ 1. It is recommended that you get ____ percent or more of your daily intake of calories from carbohydrates.

a. 25
b. 30
c. 40
d. 60

____ 2. Studies show that ____ may help lower blood cholesterol levels.

a. lutein
b. soluble fiber
c. insoluble fiber
d. Hydrogenation

____ 3. Peanuts are high in ____.

a. cholesterol
b. carbohydrates
c. Fiber
d. Fat

____ 4. Water-soluble vitamins, which are needed on a daily basis, include ____.

a. vitamins A, C, and D
b. vitamins A, D, E, and K
c. B vitamins and vitamin C
d. vitamins C and D

Name _____

Completion
Complete each sentence or statement.

five	sugars	protein	complete
essential	incomplete	E	fat-soluble
water-soluble	fat	iron	D
A	sodium	caffeine	carbohydrates
four	six		

5. Although there are more than 40 different nutrients, they are grouped into just _____ categories.

6. During digestion, the body breaks down starches into single _____ , which are then taken into the blood to make energy.

7. _____ is a nutrient that supplies the body with energy and acts as a cushion to protect some vital organs.

8. The amino acids that a body cannot make, and therefore must come from foods a person eats, are called _____ amino acids.

9. Foods from animal sources are called _____ proteins.

10. Foods from plant sources are called _____ proteins.

11. Vitamins such as C and B are _____ vitamins, which cannot be stored in the body for later use.

12. Vitamins such as A, D, E, and K are _____ vitamins, which can be stored in the body for later use.

13. _____ is a mineral needed by the body to help red blood cells carry oxygen to all the cells.

14. Vitamin _____, which helps build strong bones and teeth, is found in fortified milk, egg yolks, fatty fish, and liver.

15. Beverages that contain _____ are not the best sources of water because they make the body lose some water.

16. The main source of energy for the body is _____.

Name _____

Matching

Match each source with the correct nutrient. Do not use any source more than once. Some sources will not be used.

a. bananas, oranges, dry beans, fish
b. canned fish; dairy products
c. cantaloupe, oranges, kiwi, tomatoes
d. cauliflower, cabbage, egg yolks
e. dark green and deep yellow fruits and vegetables
f. dried fruits, meat, fish, egg yolks
g. fortified milk; egg yolks
h. meat, poultry, fish, dairy products
i. oat products, dry beans
j. peanuts, dry beans, seeds
k. potatoes, corn, bread, rice

____ 17. complex carbohydrates

____ 18. calcium

____ 19. Iron

____ 20. vitamin A

____ 21. vitamin D

____ 22. vitamin C

Match each nutrient with the correct description. Each nutrient will be used at least once.

a. Carbohydrates
b. Fats
c. proteins
d. vitamins

____ 23. Needed in smaller amounts than the other nutrients listed

____ 24. Should provide 30% or less of your calories

____ 25. Should provide 12 to 15% of your calories

____ 26. Should provide 55% or more of your calories

____ 27. Provide 9 calories per gram

____ 28. Provide 0 calories per gram

____ 29. Build new body tissue and repair worn-out body cells

Name _____

Match each term to the correct definition. Do not use any term more than once. Some terms will not be used.

a. amino acids
b. Antioxidants
c. Cholesterol
d. complex carbohydrates
e. dietary supplement
f. saturated
g. simple carbohydrates
h. unsaturated

____ 30. Kind of fat that is hard at room temperature

____ 31. Starches

____ 32. A waxy substance that is part of every cell of the body

____ 33. The small units that make up protein

Essay

Answer the following items in paragraph form, using complete sentences. Use a separate piece of paper and attach it before you turn in your test.

34. Describe the three main functions of nutrients.

35. Discuss the importance of water as a nutrient.

Name _____

Nutrient Test
Answer Section

MULTIPLE CHOICE

1. D
2. B
3. D
4. C

COMPLETION

5. six
6. sugars
7. Fat
8. essential
9. complete
10. incomplete
11. water-soluble
12. fat-soluble
13. Iron
14. D
15. caffeine
16. carbohydrates

MATCHING

17. K
18. B
19. F
20. E
21. C
22. G

23. D
24. B
25. C
26. A
27. B
28. D
29. C

Name _____

30. F
31. D
32. C
33. A

SHORT ANSWER

34. Complete answer must include the following information:
    - Nutrients give you energy for your daily activity
        - *Carbohydrates and Protein supply 4 calories per gram*
        - *Fat supply 9 calories per gram*
        - *Vitamins, Minerals, and Water supply 0 calories*
    - Nutrients help you build and repair your body
        - *Protein promotes growth, builds new body tissue, and repairs worn-out body cells.*
        - *If Carbohydrates and Fat are in short supply, then the body will use protein for energy, not allowing it to help repair the body.*
    - Nutrients keep your body processing going
        - *Vitamins and Minerals provide the "spark" that keeps your body's many systems running*
        - *Vitamins and Minerals play key roles in making sure various processes occur and keeping them regulated (i.e. energy production)*
        - Water aids in digestion of food, helps transport nutrients and wastes, regulates body temperature, etc.
        - Water is vital for life – our body needs to replenish what it loses each day

35. Complete answer must include the following information:
    - You can live only a few days without water
        - *Our body is 65% water and as it loses water, it needs to be replenished or else we dehydrate*
    - Carries nutrients
        - *Water is needed for water soluble nutrients to dissolve and be available for the body to use*
        - *Water is a part of the blood that carries nutrients*
    - Eliminates waste
        - *Not enough water can cause damage to kidneys after prolonged dehydration*
    - Helps regulate body temperature
        - Our body needs to replenish what it loses each day while we perspire

NOTE: Note: Detailed responses to questions #34 and #35 would include the information found in italics.