NO PREP

Nutrition Across the Lifespan

Includes: Student reading, case study, differentiated questions, teacher key

Name: Period: Date:

Nutrition Across the Lifespan

The Same Six Nutrients, Constantly Shifting Amounts

Nutritional needs are not fixed. The six nutrient groups stay the same from birth to old age, but the amounts required, the reasons they are required, and the practical obstacles to getting them change substantially across a life. A two-year-old, a sixteen-year-old athlete, a pregnant adult, and an eighty-year-old living alone are all solving genuinely different problems with the same grocery store. Two patterns explain most of the shifts. The first is that growth drives demand. Any period of rapid tissue building, meaning infancy, the adolescent growth spurt, and pregnancy, raises the requirement for protein, calcium, iron, and total energy well above the baseline for a person's size. The second is that the relationship

Name: **Period:** **Date:**

Nutrition Across the Lifespan

The Same Six Nutrients, Constantly Shifting Amounts

Nutritional needs are not fixed. The six nutrient groups stay the same from birth to old age, but the amounts required, the reasons they are required, and the practical obstacles to getting them change substantially across a life. A two-year-old, a sixteen-year-old athlete, a pregnant adult, and an eighty-year-old living alone are all solving genuinely different problems with the same grocery store. Two patterns explain most of the shifts. The first is that growth drives demand. Any period of rapid tissue building, meaning infancy, the adolescent growth spurt, and pregnancy, raises the requirement for protein, calcium, iron, and total energy well above the baseline for a person's size. The second is that the relationship between calories and nutrients does not stay constant. Calorie needs generally rise through childhood, peak in adolescence and early adulthood, and decline with age as activity and muscle mass decrease. Micronutrient needs, meanwhile, mostly hold steady or increase. That divergence produces the single most important concept in later-life nutrition, which is nutrient density, meaning the amount of nutrition delivered per calorie. A teenager burning through 2,800 calories a day has room for some nutritionally empty food and still meets every requirement. A seventy-five-year-old eating 1,700 calories does not have that margin, because every low-nutrient calorie displaces a nutrient the day still needs. Understanding this is what makes a Family and Consumer Sciences class practical rather than theoretical, because most students will at some point cook for a small child, a pregnant family member, or an aging relative.

Infancy: The Year With the Most Rules

The first year of life carries more firm nutritional rules than any other period, because an infant's digestive and immune systems are still developing. Breast milk or iron-fortified formula supplies complete nutrition for roughly the first six months, and major health organizations recommend exclusive feeding that way for about

that long. Solid foods generally begin around six months, when an infant can sit with support and has lost the reflex that pushes food out of the mouth, and early foods supplement rather than replace milk or formula. Two rules are absolute and worth knowing precisely. No honey before twelve months, because honey can carry spores of Clostridium botulinum, which an infant's immature digestive system cannot suppress, causing infant botulism. No cow's milk as a main drink before twelve months, because it is low in iron, high in protein and minerals that stress developing kidneys, and can irritate the intestinal lining. Guidance on allergens moved in the opposite direction from what many parents expect. Earlier advice recommended delaying peanuts and other allergenic foods, and research showed that delay increased rather than decreased allergy risk. Pediatric guidelines have recommended introducing age-appropriate forms of peanut and other common allergens early, often around six months, for most infants, with a physician consulted first for high-risk infants. Choking hazards are the other constant concern, and whole grapes, nuts, popcorn, hot dog rounds, and hard raw vegetables all require modification or avoidance in the early years.

Childhood and Adolescence: The Bone Bank Closes

Toddlers and preschoolers eat in a way that alarms adults and is usually normal. Appetite becomes erratic after the first year because growth slows dramatically, food refusal and suspicion of new foods peak between roughly two and six, and intake tends to balance out across a week even when a single day looks impossible. Repeated neutral exposure works better than pressure, and it commonly takes eight to fifteen exposures before a child accepts a new food. A widely used framework divides the job: the adult decides what food is offered, when, and where, and the child decides whether to eat and how much. Adolescence is the second period of rapid growth and the one with the highest total nutrient demand of any stage after infancy. Calorie and protein needs climb sharply. Calcium requirements are higher for ages nine through eighteen than for adults, at 1,300 milligrams a day, because roughly ninety percent of adult bone mass is built by the end of the teen years. That window does not reopen, which is why the phrase bone bank is useful. Deposits made in adolescence are what remains available decades later against age-related bone loss. Iron needs rise for everyone during the growth spurt, from expanding muscle mass and blood volume, and rise further and permanently for teens who begin

menstruating. This all lands during the years when eating gets least supervised, most rushed, and most social, which is precisely the tension a health or FACS class exists to address.

Pregnancy and Adulthood: Quality Over Quantity

Pregnancy raises nutrient needs far more than it raises calorie needs, which makes eating for two one of the most persistent and least accurate pieces of folk advice in circulation. Additional energy requirements are modest, commonly cited as roughly 340 extra calories per day in the second trimester and around 450 in the third, with essentially no increase in the first. Several specific nutrients rise sharply. Folate, or folic acid in supplement form, is the most time-sensitive, because it prevents neural tube defects that form in the first few weeks of pregnancy, frequently before a person knows they are pregnant. That timing is why the recommendation applies to anyone who could become pregnant rather than only to those already expecting, and why grain products in the United States have been fortified with folic acid since 1998. Iron needs roughly double to support expanded blood volume and the developing fetus. Calcium, iodine, and choline all matter. Several foods are avoided during pregnancy for infection and toxicity reasons, including high-mercury fish such as swordfish and king mackerel, unpasteurized milk and soft cheeses, raw or undercooked meat and eggs, deli meats unless heated, because of listeria risk, and alcohol, for which no safe amount has been established. Adulthood between roughly twenty and sixty is the stage with the fewest special rules and the longest consequences, since it is where eating patterns either build or erode cardiovascular health, bone density, and metabolic health over decades of small daily choices.

Older Adults: Fewer Calories, Same Requirements

Later adulthood inverts the problem. Calorie needs decline with reduced activity and muscle mass, while requirements for most vitamins and minerals stay level or rise, which leaves a shrinking budget that must still cover everything. Nutrient density stops being a nice idea and becomes the organizing principle of every meal. Several changes are specific enough to plan around. Vitamin B12 absorption declines with age, because reduced stomach acid impairs the release of B12 bound to protein in food, and guidance recommends that adults over fifty get much of their B12 from fortified foods or supplements, where it is in a form absorbed without stomach acid. Vitamin D and calcium needs rise to slow bone loss, and vitamin D synthesis in skin

becomes less efficient with age. Protein needs per pound of body weight increase modestly to counter sarcopenia, the gradual loss of muscle mass that drives falls and lost independence. The sensation of thirst becomes blunted, so dehydration is common and frequently presents as confusion or weakness rather than as thirst. The obstacles are just as often practical as physiological. Medications alter appetite and taste. Dental problems make many foods difficult. Fixed incomes constrain the grocery budget. Reduced mobility complicates shopping and standing to cook. And eating alone, after decades of eating with someone, reliably reduces how much and how well a person eats, which is why community meal programs improve nutrition partly by being social.

Key Information: Nutrition Needs by Life Stage

Detail	Information
First 6 Months	Breast milk or iron-fortified formula supplies complete nutrition
Before 12 Months	No honey, because of infant botulism risk; no cow's milk as a main drink
Allergen Introduction	Introduce common allergens early, around 6 months, for most infants
Ages 9 to 18 Calcium	1,300 mg per day; about 90 percent of bone mass is built by then
Teen Iron	Rises with growth, and further for teens who begin menstruating
Pregnancy Calories	About 340 extra in the second trimester, 450 in the third
Folic Acid	Prevents neural tube defects that form in the first few weeks
Adults Over 50	Get B12 from fortified foods or supplements as absorption declines

Case Study: One Kitchen, Two Sets of Needs

Since her grandfather moved in, Selena has done most of the cooking, and she cannot figure out why the same dinner works for one of them and not the other. She is sixteen, runs cross country, and is hungry constantly. Her grandfather is seventy-eight, eats about half of what she does, and has been losing weight. Her FACS teacher asked how many calories each of them needed. Selena guessed correctly that hers were much higher. Then the teacher asked about calcium and B12. "Same?" Selena said. "Close to yours," her teacher said, and explained that his calcium and B12 needs are nearly the same as hers even though his calorie budget has shrunk by a third, and that his body absorbs less B12 from food than it used to. "So every plain white roll costs him more than it costs me." Selena started cooking differently rather than cooking twice. Same meals, but she moved to fortified cereal at breakfast, added beans and dark greens to dishes they both ate, and put a pitcher of water on the table because he never says he is thirsty.

1. Selena said a plain white roll costs her grandfather more than it costs her. Explain what she meant using nutrient density.

2. Explain two age-related changes from the reading that Selena's new cooking choices address.

Multiple Choice

1. Honey is avoided before twelve months of age because it can carry:

    a) Pollen that triggers seasonal allergies

    b) Bacteria destroyed only by refrigeration

    c) More sugar than an infant can process

    d) Spores that cause infant botulism

2. Why is calcium intake during ages nine through eighteen described as a bone bank?

    a) Calcium is stored in the blood until adulthood begins

    b) Most adult bone mass is built then and that window does not reopen

    c) Teens absorb less calcium than adults do from the same food intake

    d) Bone density can be rebuilt at any age with enough calcium

3. The advice to eat for two during pregnancy is misleading mainly because:

    a) Calorie needs actually decrease during the third trimester

    b) Nutrient needs decrease while calorie needs stay the same

    c) Nutrient needs rise far more than calorie needs do

    d) Additional calories are needed only in the first trimester

Matching

Write the letter of the correct definition on the line next to each term.

Term	Definition
1. ___ Nutrient Density	A) The idea that adolescent deposits fund bone strength decades later
2. ___ Infant Botulism	B) Age-related muscle loss that raises protein needs later in life
3. ___ Folic Acid	C) The illness that makes honey unsafe during a baby's first year
4. ___ Sarcopenia	D) The nutrient preventing neural tube defects in very early pregnancy
5. ___ Bone Bank	E) How much nutrition a food delivers for each calorie it costs

Fill-in-the-Blank

1. Teens aged 9 to 18 need 1,300 mg of calcium each _____.

2. Cow's milk should not be a main drink before _____ months.

3. After age fifty, B12 should come from _____ foods.

Short Answer

Answer each question in 2-4 complete sentences.

1. Explain why nutrient density matters more for an older adult than for a teenager.

_____

_____

_____

2. Explain why folic acid guidance applies before a pregnancy rather than during it.

3. Explain how eating alone can become a nutrition problem for an older adult.