Advancing Youth Scientific Literacy: Strategies to Develop Knowledge and Skills to Help Youth Make Healthy Choices

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Scientific Literacy and 21st Century Society

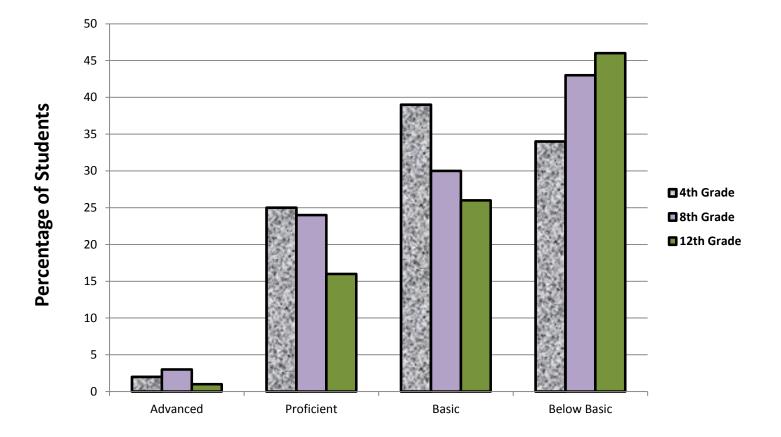
- Scientific Literacy: Having a fundamental understanding of scientific concepts and theories and the capacity to use scientific thinking to address important societal challenges (AAAS, 1990; Miller, 2006; Perkins-Gough, 2006/2007).
- 21st century society is greatly dependent upon a scientifically literate population. Issues associated with science include key public policy decisions (e.g., stem cell research and global warming) and personal consumer choices (e.g., medicine and nutrition).

Adult Scientific Literacy

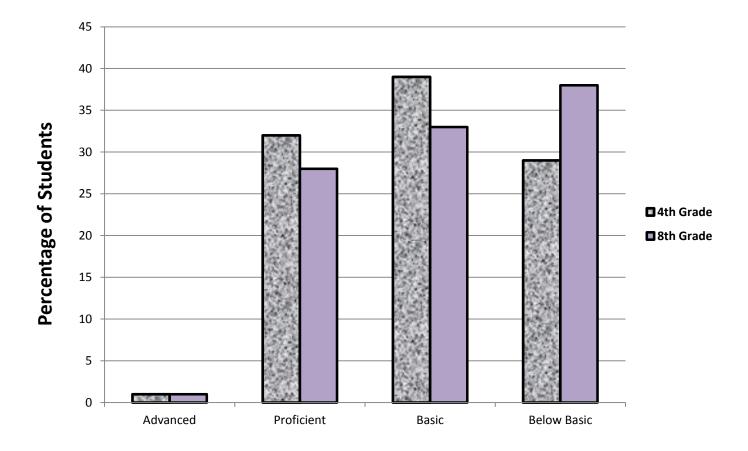
- Current levels of adult scientific literacy are considered inadequate (California Academy of Sciences, 2009). Miller (2006) estimates that only 28% of the adults in the U.S. are scientifically literate.
- Deficits in science literacy places individual in jeopardy of not having the requisite knowledge and skills for successful careers and comprehensive engagement in today's society.
- Deficits also impede the nation's ability to remain scientifically competitive within the international community (National Academy of Sciences, 2007).

Youth Scientific Literacy: The National Picture

- Results from the 2005 and 2009 National Assessment of Educational Progress (NAEP) for 4th, 8th, and 12th graders have revealed poor science achievement at all three grade levels (Grigg, Lauko, and Brockway 2006; NCES 2011).
 - In 2005 & 2009, approximately 70% of students at all grade levels scored at the "Basic" or "Below Basic" levels.
 - "Advanced Proficiency" was 3% or less at all grade levels in 2005 & 2009.
- Trends are not distributed equally across the population:
 - Caucasian and Asian American outperformed African Americans & Latinos.
 - Youth from high-income households scored higher than their peers from low-income households.
- Overall, California students scored below national averages on the NAEP assessments, ranking 48th and/or 49th among all states.



Summary Results 2005 National Assessment of Education Progress (NAEP) Students in Grades 4, 8, and 12.



Summary Results 2009 National Assessment of Education Progress (NAEP) Students in grades 4 and 8.

Low Levels of Youth Scientific Literacy: Associated Concerns

- K-12 students who score below basic levels will lack the foundational knowledge and skills necessary for scientific careers and full participation in today's knowledge society (National Academy of Sciences, 2007).
 - Declining number of college students in the U.S. who earn undergraduate degrees in science.
 - Decreased production of new scientific knowledge by scientists in the United States.
 - Decreased availability of qualified workforce.
 - Decreased capacity to use knowledge and scientific thinking (skills) to address important societal challenges, including key public policy decisions and personal consumer choices (e.g., <u>nutrition</u>) (AAAS, 1990; Miller, 2006; Perkins-Gough, 2006/2007).

Strategies to Advance Youth Scientific Literacy



- Pedagogy
- Curriculum Materials
- Educator Professional Development
- Formal, Nonformal, and Informal Learning Environments

Science Pedagogy

- Most science is taught using the transmission model of instruction (e.g., lectures, demonstrations).
- Lacks theoretical justification; evidence indicates that it is neither efficient nor effective for teaching science.
- Typically used because this is how teachers were taught.

Science Pedagogy

- Second major instructional practice used in teaching science is the constructivist model.
- This model involves learners actively constructing knowledge through interactions with the environment: seeing, hearing, touching, smelling, and tasting.
- Data from their senses allow learners to actively construct meaning.

Constructivism

- Constructivism: Knowledge is developed through experiences, interactions between learners and their environment. Each new experience draws upon prior ones, modifying them in some way (Dewey, 1933; Fosnot, 1996).
- Knowledge construction or "meaning making" is learner dependent; it reflects a learner's developmental stage and the cultural context within which the learning occurs (Starratt, 2001).
- Knowledge is constructed as a result of the development of schemata or mental models (Richardson, 2003).
- New information is assimilated by the learner. New schemata are formed when new information is encountered existed.
- When new information challenges prior knowledge an adjustment in understanding – accommodation – is necessary (Richardson, 2003).

Curriculum Development

- Inquiry: A constructivist-based pedagogical approach to teaching and learning that involves problem-solving through the collection and analysis of information.
- Experiential Learning: A pedagogical strategy that involves specific components that are part of a recurring cycle: 1) Experience; 2) Reflection; 3) Application.

What is Inquiry?

"Inquiry is a process that all individuals naturally use in approaching new situations and solving problems in life. By engaging in inquiry, ...children...gain experience...that will improve their capacity to handle life situations and solve everyday problems."

- Edmund Marek and Ann Cavallo (1997)

Inquiry and Learners

- Active investigation; learners take responsibility for their own learning.
- Open-ended questioning; questions "reside" with the learners.
- Observing and manipulating (mentally or physically) objects, phenomena, and/or nature; and
- The acquisition/discovery of new knowledge.

Inquiry and Educators

- Learner-Centered Instruction: Inquiry places educators in the role of being facilitators of learning, rather than a disseminators of known information.
- Allows educators to better understand their learners, what they know, interests they may have, and how their minds work.

What is Experiential Learning?

- A learner-centered pedagogical strategy.
- Promotes a deep understanding of subject matter, critical thinking, and lifelong learning (Eyler, 2009).
- Involves a recurring cycle that includes:
 - \circ Concrete experience
 - \circ Period of reflection
 - Application of learning to new contexts (Enfield et al., 2007).

Experiential Learning

- Intentional design of curriculum activities:
 - Experience: Develop an activity whereby learners receive little or no help from the facilitator (e.g., making products or models; role-playing; problemsolving). Create cognitive dissonance (the "groan zone"); opportunities to construct knowledge.
 - Reflection:
 - \odot Application:

Experiential Learning

- Intentional design of curriculum activities:
 - Experience:
 - Reflection: Discuss the experience. Share results, reactions, and observations; identify themes, problems, and issues; connect to real-world examples. <u>Reflective thought is considered to be</u> <u>truly educative</u>.

 \circ Application:

Experiential Learning

- Intentional design of curriculum activities:
 - Experience:
 - Reflection:

 Application: Learners apply new knowledge and skills to authentic, real-world situations.
Application is where "the rubber meets the road," and is what makes learning last.

Nutrition to Grow On: Inquiry-Based Supplement

- Introduction to Nutrition, Agriculture, and Gardening
- Getting Physically Active
- Nutrients We Need
- Serving Sizes
- MyPlate
- Food Labels
- Consumerism
- Making Healthy Snacks

DAI	IRY	A
DAI	RI	А

Nutrition Facts

Serving Size 21g Servings Per Container 1

Calories 70	Cale	ories from	Fat 4
		% Dai	ly Value
Total Fat 5g	Č		8%
Saturated F	Fat 3g		15%
Trans Fat	0g		
Cholesterol			7%
Sodium 270			119
Total Carbo	C	2	1%
Dietary Fib			0%
	or og		• • •
Sugars 1g	<u> </u>		
Protein 4g			
Vitamin A 4%	1	Vitamin	
Coloium 25	0/		
Calcium 25	% •	Ir	on 0%
*Percent (%) Dai calorie diet. Your ower basedon yo	ly Values are daily values	e based on a may be high seds.	2,000 her or I
*Percent (%) Dai calorie diet. Your ower basedon yo	ly Values are daily values ur calorie ne Calories	e based on a may be high seds. 2,000 2	2,000 her or I
*Percent (%) Dai calorie diet. Your ower basedon yo Total Fat	ly Values are daily values our calorie ne Calories Less than	e based on a may be high eds. <u>2,000 2</u> 65g	2,000 her or I .500 80g
*Percent (%) Dai calorie diet. Your ower basedon yo Total Fat Saturated Fat	ly Values are daily values ur calorie ne Calories Less than Less than	e based on a may be high eds. <u>2,000 2</u> 65g 20g	2,000 her or I .500 80g 25g
*Percent (%) Dai calorie diet. Your ower basedon yo Total Fat Saturated Fat Cholesterol	ly Values are daily values our calorie ne <u>Calories</u> Less than Less than Less than	e based on a may be high eeds. 2,000 2 65g 20g 300mg	2,000 her or I ,500 80g 25g 300mg
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D	AIRY	В	
Nutriti Serving Size Servings Per	1/2 cup ((66g)	
Amount per Se	rving		
Calories 137		ories from	Fat 65
		% Dai	ly Value*
Total Fat 7g	1		11%
Saturated F	Fat 4g		22%
Trans Fat	0g		
Cholesterol	29mg		10%
Sodium 53r			2%
Total Carbo	0	16a	5%
Dietary Fib			2%
Sugars 14			
Protein 2a	9		
Vitamin A 6%	•	Vitamir	n C 1%
Calcium 8%	•	In	on 0%
*Percent (%) Dai calorie diet. Your ower basedon yo Total Fat Saturated Fat Cholesterol	daily values our calorie ne <u>Calories</u> Less than Less than Less than	may be higi eeds. 2,000 2 65g 20g 300mg	500 80g 25g 300mg
Sodium	Less than	2,400 mg	2,400mg
Total Carbohydal Dietary Fiber	e	300g	375g 30g

25g

30g

Total Carbohydate Dietary Fiber

DA	IRY C	;	
Nutriti Serving Size Servings Per	1 cup (25	50g)	
Amount per Ser	rving		
Calories 157		ories fror	n Fat 22
			ly Value'
Total Fat 3g	ĺ.		4%
Saturated F			8%
Trans Fat			- 10
Cholesterol	<u> </u>		3%
Sodium 15	and the second		6%
Total Carbol		26a	9%
Dietary Fib		209	5%
Sugars 25			57
Protein 8g	9		
Frotenn og			
Vitamin A 10	% ·	Vitam	in C 49
Calcium 29	% •	l.	ron 39
*Percent (%) Dail calorie diet. Your ower basedon yo	daily values ur calorie ne	may be hig eds.	her or I
Total Fat	Calories Less than	2.000 2 65g	80a
Saturated Fat	Less than		aug 25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than		
Total Carbohydat	e	300g	375g
Dietary Fiber		25g	30g

FRUIT A

Nutrition Facts Serving Size 149g

Servings Per Container 1

Calories 77	Ca	lories fro	m Fa	at 2
		% Dai	ly Va	lue
Total Fat 0g	1			0%
Saturated I	Fat 0g			0%
Trans Fat	0q			
Cholesterol	~		- 5	0%
Sodium 1mg				0%
Total Carbo		21a	-	7%
Dietary Fib			1	4%
minerative states and a second states and				- /
Sugars 15	y			
Protein 0g				
11.01 - 20 - 105-34	6	8/3h - 3t	82 9	1.005
Vitamin A 20/		5 M	0	140.
Vitamin A 2%	6 ·	Vitamin	0	117
Calcium 1%		the second s	on	
Calcium 1% *Percent (%) Dai calorie diet. Your	/vilues and daily values	based on a may be high	on 2,00	1% 0
Calcium 1%	o • Iy Values are daily values pur calorie ne	Irc based on a may be high eeds.	2,00 neror	1% 0
Calcium 1% *Percent (%) Dai calorie diet. Your	/vilues and daily values	Irc based on a may be high eeds.	on 2,00	1% 0
Calcium 1% *Percent (%) Dai calorie diet. Your ower basedon yo	o o o o o o o o o o o o o o o o o o o	based on a may be high eds. 2,000 2 65g	2,00 12,00 her or ,500	1% 0
Calcium 1% *Percent (%) Dai calorie diet. Your ower basedon yo Total Fat Saturated Fat Cholesterol	o o o o o o o o o o o o o o o o o o o	Irc may be high eeds. 2,000 2 65g 20g 300mg	2,00 ter or ,500 80g 25g 300	1% 0 1
Calcium 1% *Percent (%) Dai calorie diet. Your ower basedon your Total Fat Saturated Fat Cholesterol Sodium	o o o o o o o o o o o o o o o o o o o	Inc a based on a may be high eds. 2,000 2 65g 20g 300mg 2,400 mg	2,00 her or ,500 80g 25g 300 2,40	1% 0 1 10mg
Calcium 1% *Percent (%) Dai calorie diet. Your ower basedon yo Total Fat Saturated Fat Cholesterol	o o o o o o o o o o o o o o o o o o o	Irc may be high eeds. 2,000 2 65g 20g 300mg	2,00 ter or ,500 80g 25g 300	1% 0 10mi

FRUIT B

Nutrition Facts Serving Size 1/2 cup (98g) Servings Per Container 2

Amount per Serving Calories 73 Calories from Fat 1 % Daily Value* Total Fat Og 0% Saturated Fat 0g 0% Trans Fat 0g Cholesterol Omg 0% Sodium 6mg 0% Total Carbohydrate 20g 7% Dietary Fiber 1g 5%

Sugars 18g		
Protein 0g		
Vitamin A 7%	•2	Vitamin C 5%

Calcium 0% Iron 1% . *Percent (%) Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or I

	Calories	2,000	2,500
Total Fat	Less than	65g	80g
Saturated Fat	Less than	20g	25g
Cholesterol	Less than	300mg	300mg
Sodium	Less than	2,400 mg	2,400mg
Total Carbohyda	te	300g	375g
Dietary Fiber		250	30a

FR	UIT C			
Nutriti Serving Size Servings Per	43g		5	
Amount per Se Calories 129		lories fr	om F	at 2
-		% D	aily V	alue*
Total Fat 0g	1			0%
Saturated I			-	0%
Trans Fat				- 10
Cholesterol	<u> </u>			0%
Sodium 5n				0%
Total Carbo	al a de la contra d	340	S	11%
Dietary Fib		<u>549</u>		6%
Sugars 25				0 70
Protein 1g	9			
Vitamin A 0%	•	Vitam	in C	2%
Calcium 2%	6.		ron	4%
*Percent (%) Dai calorie diet. Your ower basedon yo Total Fat Saturated Fat Cholesterol	daily values our calorie ne <u>Calories</u> Less than	a may be hi eeds. 2,000	igher o 2,500 80(25)	er I
Sodium	Less than	2,400 mg	2,4	00mg
Total Carbohydat		300g	375	

GRAIN	s	А
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Nutrition Facts

Serving Size 2 slices (76g) Servings Per Container 8

Calories 180) Calc	ories from	Fat 20
		% Dai	ly Value'
Total Fat 2g			4%
Saturated F	at Og		0%
Trans Fat			
Cholesterol			0%
Sodium 270			12%
Total Carbo		360	12%
		oog	16%
Dietary Fib	ei 4g		10%
Sugars 6g			
Protein 8g			
Vitamin A 0%	•	Vitamir	n C 0%
Vitamin A 0% Calcium 8%	2.2		n <u>C 0%</u> on 12%
	2.2		
Calcium 8%	<u>.</u>	In	on 12%
Calcium 8%	/o • Iy Values are	lro based on a	on 12%
Calcium 8% *Percent (%) Dai calorie diet. Your	y Values are daily values	based on a may be hig	on 12%
Calcium 8%	y Values are daily values	lro based on a may be hig eeds.	on 12%
Calcium 8% *Percent (%) Dai calorie diet. Your ower basedon yo	y Values are daily values bur calorie ne Calories	based on a may be hig eds. 2,000 2	on 12% 2,000 her or I
Calcium 8% *Percent (%) Dai calorie diet. Your ower basedon yo	y Values are daily values bur calorie ne Calories Less than	based on a may be hig eds. 2,000 2 65g	on 12% 2,000 herori ,500 80g
Calcium 8% *Percent (%) Dai calorie diet. Your ower basedon yo Total Fat Saturated Fat	y Values are daily values bur calorie ne Calories Less than Less than	In based on a may be hig eeds. 2,000 2 65g 20g	on 12% 2,000 her or I ,500 80g 25g
Calcium 8% *Percent (%) Dai calorie diet. Your ower basedon yo Total Fat Saturated Fat Cholesterol	ly Values are daily values bur calorie ne Calories Less than Less than Less than	In may be high eds. 2,000 2 65g 20g 300mg	2,000 her or I 500 80g 25g 300mg
Calcium 8% *Percent (%) Dai calorie diet. Your ower basedon yo Total Fat Saturated Fat Cholesterol Sodium	y Values are daily values our calorie ne Calories Less than Less than Less than	In based on a may be hig eds. 2,000 2 65g 20g 300mg 2,400 mg	2,000 her or I 500 80g 25g 300mg 2,400mg
Calcium 8% *Percent (%) Dai calorie diet. Your ower basedon yo Total Fat Saturated Fat Cholesterol	y Values are daily values our calorie ne Calories Less than Less than Less than	In may be high eds. 2,000 2 65g 20g 300mg	2,000 her or I 500 80g 25g 300mg

GRAIN	IS B
Nutrition	Facts

Serving Size 1 cup Servings Per Container 1

Calories 20	5 Cal	ories fron	n Fat 4
F		% Dai	ly Value
Total Fat 0g	1		1%
Saturated			1%
Trans Fat	0g		
Cholesterol	Omg		0%
Sodium 2m	0.0000000000000000000000000000000000000		0%
Total Carbo	0	45a	15%
Dietary Fib	- 151 BA		3%
Sugars Og	1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1 1		0,0
The second s	2		
Protein 4g			
Vitamin A 0%	6 ·	Vitamir	n C 0%
Calcium 2%		Ire	on 11%
	9 51 - 1997 - 1998 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1997 - 1		
*Percent (%) Dai			
calorie diet. Your ower basedon yo			her or I
	on carone ne	ious.	
ower basedon ye			
	Calories	2.000 2	,500
Total Fat	Calories Less than	65g	80g
Total Fat Saturated Fat	Calories Less than Less than	65g 20g	80g 25g
Total Fat Saturated Fat Cholesterol	Calories Less than Less than Less than	65g 20g 300mg	80g 25g 300mg
Total Fat Saturated Fat Cholesterol Sodium	Calories Less than Less than Less than Less than	65g 20g 300mg 2,400 mg	80g 25g 300mg 2,400mg
Total Fat Saturated Fat Cholesterol	Calories Less than Less than Less than Less than	65g 20g 300mg	80g 25g

GRAINS C Nutrition Facts Serving Size 1 (56g) Servings Per Container 12 Amount per Serving Calories 223 Calories from Fat 96 % Daily Value* Total Fat 11g 16% Saturated Fat 3g 15% Trans Fat 0g Cholesterol 7mg 6% Sodium 217mg 9% Total Carbohydrate 28g 9% Dietary Fiber 1g 5% Sugars 11g Protein 3g Vitamin A 0% Vitamin C 1% • Calcium 3% • Iron 12% *Percent (%) Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or I ower basedon your calorie needs. Calories 2,000 2,500 Total Fat Less than 65g 80g Saturated Fat Less than 20g 25g 300mg Cholesterol Less than 300mg Less than 2,400 mg 2,400 mg Sodium Total Carbohydate 300g 375g **Dietary Fiber** 25g 30g

PROTEIN A

Nutrition Facts

Serving Size 2 pieces (148g) Servings Per Container 5

Calories 43	1 Calo	ries from	Fat 241
		% Dai	ly Value'
Total Fat 27	'g		41%
Saturated F	Fat 7g		35%
Trans Fat			
Cholesterol			55%
Sodium 758			31%
Total Carbo		16a	5%
Dietary Fib			0%
Sugars Og	247 02-04		07.
Protein 30g	1		
Vitamin A 4%		2007	n C 0%
Calcium 4%	• •	In	on 9%
*Percent (%) Dai			
calorie diet. Your			
calorie diet. Your ower basedon yo		eds.	,500
calorie diet. Your ower basedon yo 	our calorie ne Calories Less than	eds. 2,000 2 65g	,500 80g
calorie diet. Your ower basedon yo Total Fat Saturated Fat	our calorie ne <u>Calories</u> Less than Less than	eds. 2,000 2 65g 20g	.500 80g 25g
calorie diet. Your ower basedon yo Total Fat Saturated Fat Cholesterol	our calorie ne Calories Less than Less than Less than	eds. 2,000 2 65g 20g 300mg	,500 80g 25g 300mg
calorie diet. Your ower basedon yo Total Fat Saturated Fat Cholesterol Sodium	Calories Calories Less than Less than Less than Less than	2,000 2 65g 20g 300mg 2,400 mg	,500 80g 25g 300mg 2,400mg
calorie diet. Your ower basedon yo 	Calories Calories Less than Less than Less than Less than	eds. 2,000 2 65g 20g 300mg	,500 80g 25g 300mg

PROTEIN B

Nutrition Facts Serving Size 3 oz (85g)

Servings Per Container 2

Calories 99	Cal	ories fron	n Fat 6
		% Dai	y Value
Total Fat 1g	3		1%
Saturated I	Fat Og		1%
Trans Fat	2 Constant 2 Constant No.		
Cholesterol	-		9%
Sodium 28			12%
Total Carbo		0a	0%
Dietary Fib		- 3	0%
Sugars Og			070
Protein 22g	2		_
Vitamin A 1%	6 •	Vitamir	C 0%
Calcium 1%	6 .	Inc	on 7%
			// //0
*Percent (%) Dai calorie diet. Your ower basedon yo	ily Values are daily values our calorie ne	e based on a may be high reds.	2,000 her or I
*Percent (%) Dai calorie diet. Your	ily Values are daily values	e based on a may be high reds.	2,000
*Percent (%) Dai calorie diet. Your ower basedon yo	ily Values are daily values our calorie ne Calories Less than	e based on a may be high reds. 2,000 2 65g	2,000 her or I ,500
*Percent (%) Dai calorie diet. Your ower basedon yo Total Fat	ily Values are daily values our calorie ne Calories Less than	e based on a may be high reds. 2,000 2 65g	2,000 her or I ,500 80g
*Percent (%) Dai calorie diet. Your ower basedon yo Total Fat Saturated Fat	ily Values are daily values our calorie ne Calories Less than Less than	e based on a may be high eeds. 2,000 2 65g 20g	2,000 her or l ,500 80g 25g 300mg
*Percent (%) Dai calorie diet. Your ower basedon yo Total Fat Saturated Fat Cholesterol	ily Values are daily values our calorie ne Calories Less than Less than Less than Less than	e based on a may be high reds. 2,000 2 65g 20g 300mg	2,000 her or l ,500 80g 25g 300mg

PROTEIN C **Nutrition Facts** Serving Size 100g Servings Per Container 4 Amount per Serving Calories 91 Calories from Fat 10 % Daily Value* Total Fat 1g 2% 2% Saturated Fat 0g Trans Fat 0g Cholesterol 0mg 0% Sodium 449mg 19% Total Carbohydrate 15g 5% Dietary Fiber 5g 20% Sugars 0g Protein 5g Vitamin A 0% Vitamin C 10% • Calcium 3% . Iron 9% *Percent (%) Daily Values are based on a 2,000 calorie diet. Your daily values may be higher or I ower basedon your calorie needs. Calories 2,000 2,500 Total Fat Less than 65g 80g Saturated Fat Less than 20g 25g Cholesterol 300mg Less than 300mg Sodium Less than 2,400 mg 2,400 mg Total Carbohydate 300g 375g Dietary Fiber 25g 30g

Nutrition Facts Serving Size 85g Servings Per Container 1

Calories 30	Ca	lories fro	m Fat 1
		% Dai	ly Value*
Total Fat 0g	1	2-5 2	0%
Saturated F	at Og		0%
Trans Fat			
Cholesterol	Contraction of the second		0%
Sodium 66n	•		3%
	· ·	70	20110
Total Carbo		/g	2%
Dietary Fib	er 2g		10%
Sugars 4g			
Protein 1g			
			_
Vitamin A 23	4% .	Vitami	n C 4%
Calcium 3%		Inc	on 4%
*Percent (%) Dai calorie diet. Your ower basedon yo	daily values	may be high	
calorie diet. Your	daily values	may be higi eds.	
calorie diet. Your	daily values our calorie ne	may be higi eds.	her or I
calorie diet. Your ower basedon yo Total Fat Saturated Fat	daily values our calorie ne <u>Calories</u> Less than Less than	may be higl eds. 2,000 2 65g 20g	500 80g 25g
calorie diet. Your ower basedon yo Total Fat Saturated Fat Cholesterol	daily values our calorie ne <u>Calories</u> Less than Less than Less than	may be higt eds. 2,000 2 65g 20g 300mg	500 500 80g 25g 300mg
calorie diet. Your ower basedon yo Total Fat Saturated Fat Cholesterol Sodium	daily values our calorie ne <u>Calories</u> Less than Less than Less than Less than	may be higt eds. 2,000 2 65g 20g 300mg 2,400 mg	500 80g 25g 300mg 2,400mg
calorie diet. Your ower basedon yo Total Fat Saturated Fat Cholesterol	daily values our calorie ne <u>Calories</u> Less than Less than Less than Less than	may be higt eds. 2,000 2 65g 20g 300mg	500 500 80g 25g 300mg

VEG	ETA	BLE E	3
Nutritio Serving Size 1 Servings Per C	cup (72	2g)	8
Amount per Servir	ng		1
Calories 10	Ca	lories fro	m Fat 0
-		% Da	ily Value*
Total Fat 0g			0%
Saturated Fat	t Og		0%
Trans Fat 0g	-0		
Cholesterol 0	ma		0%
Sodium 7mg			0%
Total Carbohy	drate	20	1%
Dietary Fiber		-9	3%
Sugars 1g	19		070
Protein 1g			
Frotenin ig			
Vitamin A 7%		Vitami	nC 3%
Calcium 1%			on 2%
*Percent (%) Daily V calorie diet. Your da ower basedon your	ily values calorie ne	may be hig eds.	her or l
	lories ess than		2,500
Saturated Fat Lo	a a a a carrier	65g 20g	80g 25g
24442000000000000000000000000000000000	ess than	300mg	300mg
	ess than	2,400 mg	2,400mg
Total Carbohydate		300g	375g
Dietary Fiber		25g	30g

VE	GETA	BLE (0
Nutriti Serving Size Servings Per	85g		
Amount per Se			
Calories 271	Calo	ries from	
		% Dai	ly Value*
Total Fat 14	9		22%
Saturated F	at 3g		17%
Trans Fat	4g		
Cholester			0%
Sodium 165			7%
Total Carbol		320	11%
Dietary Fib		52 <u>y</u>	12%
And the second sec	er sy		1270
Sugars 1g	(
Protein 3g			
Vitamin A 0%	, .	Vitamir	n C 4%
Calcium 1%			on 6%
*Percent (%) Dai calorie diet. Your ower basedon yo	daily values ur calorie ne	may be higi eds.	
	Calories		,500
Total Fat Saturated Fat	Less than Less than	65g	80g
Cholesterol	Less than	20g 300mg	25g 300mg
Sodium	Less than		
Total Carbohydat		300g	375g
		25g	30g

Food Label Key

Grains A: 2 slices of whole-wheat bread Grains B: 1 cup of white rice Grains C: 1 buttermilk waffle

Protein A: 2 pieces of fried chicken (thigh and drumstick)Protein B: 3 oz canned tuna, light, packed in water, drainedProtein C: 100 grams of refried beans

Vegetable A: 85 grams of baby carrots Vegetable B: 1 cup of iceberg lettuce Vegetable C: 1 small order of French fries

Fruit A: 1 small apple Fruit B: ½ cup of canned peaches with heavy syrup Fruit C: 1 small box of raisins

Dairy A: 1 slice American cheese Dairy B: ½ cup vanilla ice cream Dairy C: 1 cup chocolate milk, low fat

Experiential Learning & Inquiry

Describe:

• Experience: Opportunities for Inquiry?

Reflection: Opportunities for reflective thought?

 Application: Explain your ideas for application opportunities. "No single learning experience has a very profound influence upon the learner" (Tyler, 1949, p. 83). Subject matter must be organized in a progressive manner to bring about changes in knowledge, skills, and attitudes.

- Introduction to Nutrition, Agriculture, and Gardening
- Getting Physically Active
- Nutrients We Need
- Serving Sizes
- MyPlate
- Food Labels
- Consumerism
- Making Healthy Snacks

Scaffolding: Facilitating learners' development by building on prior knowledge to help expedite the learning of new information and skills.

Spiraling: Revisiting concepts repeatedly; building and elaborating upon them progressively to achieve full understanding.

Educator Professional Development

- The perpetuation transmission teaching methods in science is largely the result of approaches to professional development used with science educators (Garet et al., 2001).
- Most professional development in science uses *traditional* strategies (e.g., workshops, conference presentations, institutes, and courses), <u>episodic events</u> that occur at a set time and location with content delivered by someone external to the educators' learning setting. and lacking sustained.
- Traditional professional development strategies <u>lack ongoing</u> <u>support</u>; shown to be <u>ineffective</u> in fostering meaningful change in practice (Garet et al. 2001; Loucks-Horsley et al. 2003; Penuel, Fishman, Yamaguchi, and Gallagher 2007).

Educator Professional Development

- Effective approaches to educator professional development in science are referred to as *reform* strategies.
- Features include: multiple increments; active learning; focus on knowledge and skills; datadriven; constructivist-based.
- Key point: Professional development mirrors inquiry-based experiential learning. Educators better understand the process and are more effective at implementing it.

Where to Facilitate Science Learning?

- School-based instruction (formal education) need more emphasis on science and improved pedagogy.
- Out-of-School-Time (OST) Education Programs (informal and nonformal) – need systematic approaches, high quality materials, and professional development opportunities for educators.

Questions



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