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CULINARY
INSTITUTE OF
CHILD NUTRITION

CULINARY QUICK BITES

BASIC FOOD PREP SKILLS: HOW TO
MEASURE FOOD BY VOLUME



CULINARY QUICK BITES

BASIC FOOD PREP SKILLS: HOW TO MEASURE FOOD BY VOLUME

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Institute of Child Nutrition
The University of Mississippi, School of Applied Sciences
www.theicn.org

Key Area: 2 – Operations

USDA Professional Standards Code
Food Production – 2100

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TRAINING OVERVIEW

The Culinary Quick Bites training series is a tool to help child nutrition professionals develop and refine their culinary skills. Each lesson is designed to last approximately fifteen minutes. Each lesson should be facilitated (led) by the person responsible for overseeing food production at a meal site, service area, or at the district level.

Training facilitators should review the training, in its entirety, prior to conducting the training.

This training has been developed to address a variety of learning styles. The training includes an overview of the topic presented by the facilitator, an infographic to reinforce the training topic visually, a video to demonstrate the topic, and an activity to reinforce learning.

Please contact the Institute of Child Nutrition Help Desk at 1-800-321-3054 or helpdesk@theicn.org if you have any questions about how best to facilitate this training.

KEY AREA

Key Area: 2 – Operations

PROFESSIONAL STANDARDS

FOOD PRODUCTION – 2100

Employee will be able to effectively utilize food preparation principles, production records, kitchen equipment, and food crediting to prepare foods from standardized recipes, including those for special diets.

2130 – Develop culinary skills necessary for school meal preparation.

FACILITATOR'S NOTES

This training counts for 15 minutes of training credit under USDA Professional Standards learning objective 2130 – Develop culinary skills necessary for school meal preparation.

Before the training, prepare for the lesson activity and set up the kitchen workstation as described on page 16.

Deliver the lesson/training to participants:

- Read the lesson overview to the participants.
- Discuss the infographic and how it relates to the training topic.
- View the instruction video with participants.
- Answer any questions participants may have on the lesson, infographic, and video.

Complete the activity as instructed on page 16.

MATERIALS NEEDED



- Liquid measure – 1 per person
- Fluid liquid, such as water – 8 fl oz per person
- Infographic: Basics at a Glance – 1 per person
- Infographic: How to Measure Food by Volume – 1 per person
- Access to a screen to show the training video. Possible options include:
 - Site computer monitor with sound
 - Projector with sound
 - Tablets and smartphones
 - A QR code has been provided for quick access to the video on handheld devices.

LESSON OVERVIEW

OBJECTIVE:

At the end of this lesson, participants will be able to demonstrate how to measure food by volume.

GENERAL INFORMATION ABOUT USING VOLUME AS A UNIT OF MEASUREMENT

- Volume refers to the amount of space or capacity a product takes up in a three-dimensional space. Volume is the unit of measure utilized to determine the amount of a liquid ingredient that is needed to produce a recipe.
- In a recipe, volume is measured using a liquid measure, such as measuring cups.
- In USDA recipes, volume is indicated in the column labeled measure.
- Liquid items must be measured by volume.
- The measurements of weight and volume are not interchangeable.
- Types of equipment used to measure food items by volume:
 - Measuring spoons and measuring cups
 - Liquid measuring cups
- How to measure dry items like flour, baking powder, or powder sugar by volume when a scale is not available:
 - Lightly spoon the dry ingredient into the measuring cup.
 - Fill it so there's extra on top.
 - Using the flat side of a knife, gently scrape off the excess.
- How to read the meniscus (the curved line seen at the surface of a liquid in a vessel) in a liquid measuring cup:
 - A liquid's surface curves slightly. For accurate measurements, align the bottom of the curved surface (the meniscus) with the markings on the measuring cup. View at eye level.

HOW TO MEASURE FOOD BY VOLUME

- Utilizing the infographic, review the process for how to measure food by volume.
- Review the embedded training video.

After we review the infographic and video, there will be an activity to reinforce skills learned.

Basics at a Glance

Recipe Abbreviations

approx.	= approximate
tsp or t	= teaspoon
Tbsp or T	= tablespoon
c	= cup
pt	= pint
qt	= quart
gal	= gallon
wt	= weight
oz	= ounce
lb or #	= pound (e.g., 3#)
g	= gram
kg	= kilogram
vol	= volume
mL	= milliliter
L	= liter
fl oz	= fluid ounce
No. or #	= number (e.g., #3)
in. or "	= inches (e.g., 12")
°F	= degree Fahrenheit
°C	= degree Celsius or centigrade

Volume Equivalents for Liquids



60 drops	= 1 tsp	
1 Tbsp	= 3 tsp	= 0.5 fl oz
1/8 cup	= 2 Tbsp	= 1 fl oz
1/4 cup	= 4 Tbsp	= 2 fl oz
1/3 cup	= 5 Tbsp + 1 tsp	= 2.65 fl oz
3/8 cup	= 6 Tbsp	= 3 fl oz
1/2 cup	= 8 Tbsp	= 4 fl oz
5/8 cup	= 10 Tbsp	= 5 fl oz
2/3 cup	= 10 Tbsp + 2 tsp	= 5.3 fl oz
3/4 cup	= 12 Tbsp	= 6 fl oz
7/8 cup	= 14 Tbsp	= 7 fl oz
1 cup	= 16 Tbsp	= 8 fl oz
1/2 pint	= 1 cup	= 8 fl oz
1 pint	= 2 cups	= 16 fl oz
1 quart	= 2 pt	= 32 fl oz
1 gallon	= 4 qt	= 128 fl oz

Equivalent Weights



16 oz	= 1 lb	= 1.000 lb
12 oz	= 3/4 lb	= 0.750 lb
8 oz	= 1/2 lb	= 0.500 lb
4 oz	= 1/4 lb	= 0.250 lb
1 oz	= 1/16 lb	= 0.063 lb

Fraction to Decimal Equivalents



1/8	= 0.125
1/4	= 0.250
1/3	= 0.333
3/8	= 0.375
1/2	= 0.500
5/8	= 0.625
2/3	= 0.666
3/4	= 0.750
7/8	= 0.875



Metric Equivalents by Weight



Customary Unit (avoirdupois)	Metric Unit
Ounces (oz)	Grams (g)
1 oz	= 28.35 g
4 oz	= 113.4 g
8 oz	= 226.8 g
16 oz	= 453.6 g
Pounds (lb)	Grams (g)
1 lb	= 453.6 g
2 lb	= 907.2 g
Pounds (lb)	Kilograms (kg)
2.2 lb	= 1 kg (1000 g)

Metric Equivalents by Volume



Customary Unit (fl oz)	Metric Unit
1 cup (8 fl oz)	= 236.59 mL
1 quart (32 fl oz)	= 946.36 mL
1.5 quarts (48 fl oz)	= 1.42 L
33.818 fl oz	= 1.0 L



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Scoops (Dishers)



Size/No. ¹	Level Measure	Color Code ²
6	2/3 cup	
8	1/2 cup	
10	3/8 cup	
12	1/3 cup	
16	1/4 cup	
20	3-1/3 Tbsp	
24	2-2/3 Tbsp	
30	2 Tbsp	
40	1-2/3 Tbsp	
50	3-3/4 tsp	
60	3-1/4 tsp	
70	2-3/4 tsp	
100	2 tsp	

¹ Scoops are left or right hand or squeeze-type that can be used for both hands. Number on the scoop indicates how many level scoopfuls make one quart. For example, eight No. 8 scoops = 1 quart.



² Use colored dots matching the brand-specific color coding of scoop sizes.

Ladles Portion Servers



Ladle fl oz	Approx. Measure	Portion Server fl oz
1 oz	1/8 cup	1 oz
2 oz	1/4 cup	2 oz
3 oz	3/8 cup	3 oz
4 oz	1/2 cup	4 oz
6 oz	3/4 cup	6 oz
8 oz	1 cup	8 oz
12 oz	1-1/2 cups	—

Ladles and portion servers (measuring-serving spoons that are volume-standardized) are labeled "oz." "Fl oz" would be more accurate since they measure volume, not weight.

Use ladles for serving soups, stews, creamed dishes, sauces, gravies, and other liquid products.

Use portion servers (solid or perforated) for portioning solids and semi-solids such as fruits and vegetables, and condiments.

Cooking or Serving Spoons

Solid Spoons



Perforated Spoons



Slotted Spoons






Spoons vary in length (11", 13", 15", 18", 21") for ease of use in cooking or serving. Spoons can have plastic handles that are heat-resistant. Level scoops, ladles, and portion servers provide more accurate portion control than serving spoons that are not volume-standardized measure.

Specialty Spoons



A thumb notch on a server or spoon handle prevents the spoon from slipping into the pan and prevents hands from sliding into the food. Triple-edge (solid or perforated) spoons have a flat edge that increases the area where the spoon touches the bottom of the pan when stirring.

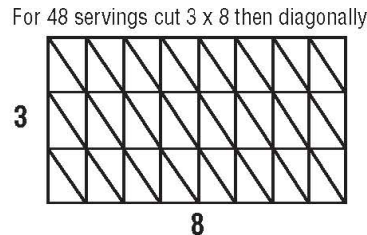
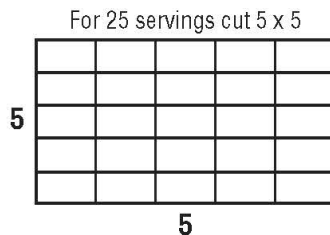
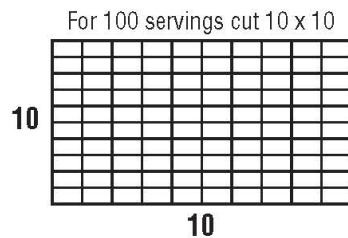
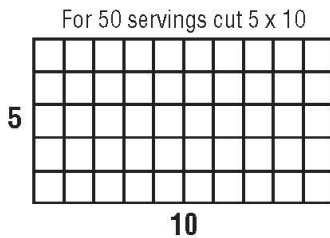
Steamtable Pan Capacity

Pan Size	Approx. Capacity	Serving Size	Ladle (fl oz)	Scoop #	Approx. # Servings
 12" x 20" x 2-1/2"	2 gal	1/2 cup	4 oz	8	64
		3/8 cup	3 oz	10	80
		1/3 cup	2.65 oz	12	96
		1/4 cup	2 oz	16	128
 12" x 20" x 4"	3-1/2 gal	1/2 cup	4 oz	8	112
		3/8 cup	3 oz	10	135
		1/3 cup	2.65 oz	12	168
		1/4 cup	2 oz	16	224
 12" x 20" x 6"	5 gal	1/2 cup	4 oz	8	160
		3/8 cup	3 oz	10	200
		1/3 cup	2.65 oz	12	240
		1/4 cup	2 oz	16	320

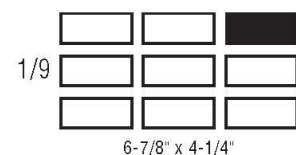
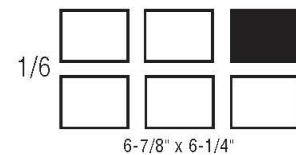
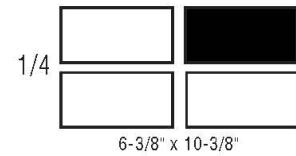
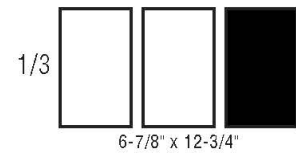
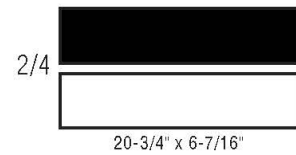
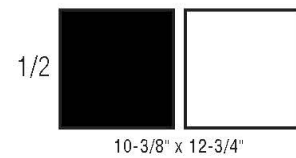
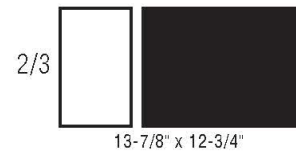
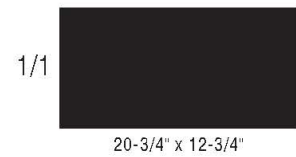
Approximate Dimensions of Serving Sizes from Different Pan Sizes

Pan	Approx. Size	No. and Approx. Size Servings per Pan		
		25	50	100
Baking or steamtable	12" x 20" x 2-1/2"	2" x 3-3/4"	2" x 2"	-----
Sheet or bun	18" x 26" x 1"	3-1/4" x 5"	3-1/4" x 2-1/2"	1-3/4" x 2-1/2"

Cutting Diagrams for Portioning



Other Pan Sizes



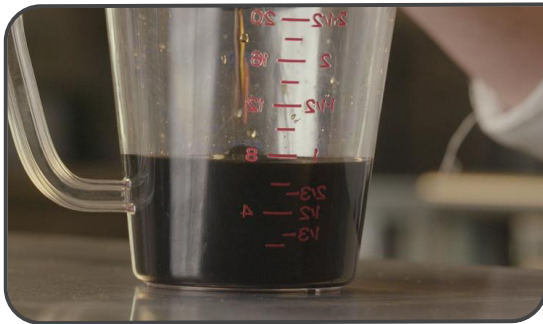
Steamtable or counter pans are available in various sizes. Smaller size pans may require the use of an adapter bar.

Culinary Quick Bites

BASIC FOOD PREPARATION SKILLS

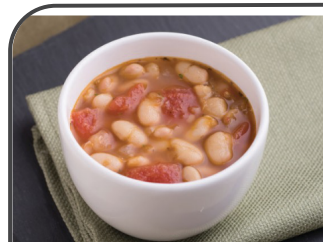
HOW TO MEASURE FOOD BY VOLUME

Volume is the unit of measure utilized to determine the amount of a liquid ingredient that is needed to produce a recipe.



Liquid items must be measured by volume.

In USDA recipes, volume is indicated in the column labeled measure.



Bean Soup USDA Recipe for Schools

Our Bean Soup recipe is a hearty combination of vegetable broth, tomatoes, beans, and green chili peppers.

NSLP/SBP CREDITING INFORMATION
1 cup (8 fl oz ladle) provides

Legume as Meat Alternate: 1 oz equivalent meat alternate, 1/2 cup red/orange vegetable, and 1/2 cup additional vegetable.

INGREDIENTS	50 SERVINGS		100 SERVINGS		DIRECTIONS
	Weight	Measure	Weight	Measure	
canola oil		1/2 cup 1 Tbsp		1 cup 2 Tbsp	1 Heat oil in a large stock pot.
Onions, fresh, diced	1 lb 4 oz	1 qt	2 lb 8 oz	2 qt	2 Add onions, garlic, bell peppers, green chilies, sugar, black pepper, oregano, and Old Bay seasoning. Simmer uncovered over medium-high heat for 2 minutes, stirring occasionally.
garlic, fresh, minced	10 1/2 oz	1/2 cup 3 Tbsp	1 lb 5 1/2 oz	1 1/2 cups 2 Tbsp	

The types of equipment used to measure food items by volume:



Measuring spoons and measuring cups



Liquid measuring cups

Culinary Quick Bites

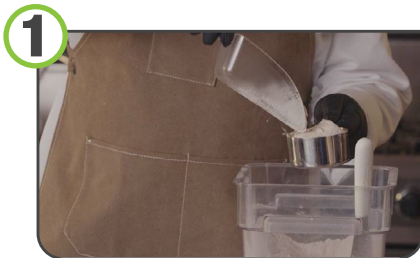
BASIC FOOD PREPARATION SKILLS

HOW TO MEASURE FOOD BY VOLUME



A liquid's surface curves slightly. For accurate measurements, align the bottom of the curved surface (called a meniscus) with the markings on the measuring cup. View at eye level.

How to measure dry items like flour, baking powder, or powdered sugar by volume, when a scale is not available.



Lightly spoon the dry ingredient into the measuring cup.



Fill it so there's extra on top.



Using the flat side of a knife, gently scrape off the excess.

PRO TIP:



Non-liquid food items, including those “wet or moist” like tomato paste, pumpkin puree, or honey should be measured by weight.

PRO TIP:



Dry herbs, spices, and leavening agents (baking powder, cream of tartar, and baking soda) can be measured by volume, in small quantities.



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CULINARY QUICK BITES

How to Measure Food by Volume

[WATCH THE VIDEO](#)

<https://vimeo.com/854356689/b6286ba253>

QR CODE

Utilize the QR code embedded to the right to share the video with staff utilizing handheld devices such as smartphones and tablets. Use the photo app on the smart device to scan the code to be directed to the video.



ACTIVITY

SETUP

MATERIALS:



Liquid measure
– 1 per person



Infographic: How
to Measure Food
by Volume
– 1 per person



Infographic:
Basics at a
Glance
– 1 per person



Fluid liquid, such as
water
– 8 fl oz per person

NOTE: If your site does not have enough materials for all participants to complete the activity simultaneously, divide participants into groups based on your materials. Allow enough time for each participant to complete the activity.

SETUP INSTRUCTIONS FOR FACILITATOR

- 1** Prior to the training, gather all of the materials needed for the activity. Set up a workstation for each participant with a liquid measuring cup.
- 2** During the activity, remember to monitor and observe staff as they practice their measurement skills.

ACTIVITY

ACTIVITY INSTRUCTIONS FOR PARTICIPANTS

- 1** Refer the participants to the infographic. Then read the instructions for the activity. Ask the participants if there are any questions before beginning the activity.
- 2** Instruct all participants to wash their hands and put on single-use gloves before starting the activity.
- 3** Participants will measure, by volume, 8 fl oz of liquid in a liquid measure.
 - Read the meniscus (the curved line seen at the surface of a liquid in a vessel) in a liquid, measuring cup at eye level.

POST ACTIVITY

- After completing the hands-on activity, recap the lesson with the participants. Offer an opportunity for participants to share their learning experience during the training and highlight any tips or takeaways they want to share with the group.
- If time allows, facilitate a discussion with the participants. Suggested discussion topics include:
 - Ask participants to discuss menu items they measure using a measuring cup vs scale.
 - Ask participants to describe how they can use liquid measures in their daily activities.
 - Ask if the participants feel more comfortable measuring food by volume or want more time to develop the skill further if time allows.
- Plan the next training session based on the needs of your staff.



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