THE VIRGINIA ADULT LEARNING RESOURCE CENTER

Virginia Commonwealth University

Painting
Lesson Three: Buying Paint

Facilitator Guide

Painting
Buying Paint

Building Plan / Blue Prints / Specs (Getting Ready to Teach)

Lifeskill Objective: Learners will be able to read paint can labels and identify the type and use of the paint. They will also be able to calculate the approximate number of gallons of paint needed to paint the interior surfaces of a house. In doing so, learners will review and practice the steps in finding surface area and several other basic construction-related math functions.

EFF Skills: Speak So Others Can Understand, Work Together, Cooperate with Others, Observe Carefully, Listen Actively, Use Math to Solve Problems and Communicate

SCANS Skills: Resources (allocate facility and material resources)
Interpersonal (participate as member of a team; teach others; work with individuals from a variety of ethnic, social or educational backgrounds; work and communicates with co-workers; provide basic leadership and negotiation skills)
Information (acquire, evaluate, organize, and maintain information related to the estimation of paint areas; this information is then interpreted and communicated through a variety of methods)
Systems (provide basic understanding of systems)
Technology (determine the procedures and tools needed to produce the desired results)

Lesson Length: 2 hours

Tools

Laying the Foundation: Lost in the Paint Aisle--overhead

Activity #1: One paint can (new or used) with clean label
Paint On Sale Handout
Complete Color Palette--with gloss sample strips; from local paint store
Paint Can Labels--optional
Paint On Sale Handout--one copy with paint cans cut out for whole group chart

Activity #2: Paint Calculation Practice Handout
Paint Calculation Practice--overhead

Activity #3: How Much Paint Will You Need? Handout A How
Much Paint Will You Need? Handout B How
Much Paint Will You Need? Handout C

Target Vocabulary

Nouns:

circumference	depth	dimension	front	height
perimeter	rear	side	surface	surface area
view	width			

Verbs:

add	divide	equal	subtract

Adjectives:

acrylic	deep	enamel	high	latex
oil-based	water-based	wide		

Laying the Foundation
Warm-Up / Presentation

Actions	Materials

1. Place the **Lost in the Paint Aisle Overhead** on the OHP. Discuss the picture using at least some of the following questions as prompts.
 	
  Y Where is this man?
  Y Why is he there?
  Y What is he feeling or thinking?
  Y Have you ever felt like the man in this picture?
  Y If you need paint, where do you go to buy it?
  Y What kind of paint were you looking for?
  Y Where was it?
  Y Was it easy to find?
  Y Has anyone ever bought the wrong paint?
  Y What happened?
  Y Can you return paint to the store if you don't like it?
 	
Explain that many people find buying paint in these big home improvement stores a little confusing because there are so many kinds of paint to choose from. To buy the right paint, you need to read the paint can labels carefully.
	Lost in the Paint Aisle–Overhead

Activity #1: Reading Paint Labels 1. Distribute the **Paint On Sale Handout** to each learner. Hold up a real paint can and, pointing to the label, explain that the label usually has all the information they need to choose a paint. Draw a chart on the board with six columns. Read the title above each column and, if possible, have a learners explain the meaning. Use the gloss strip examples from the color palette to remind learners of the meaning or *gloss* and *finish*.	*Paint On Sale Handout* *Complete Color Palette* *Paint Can*

Manufacturer	Place to Use	Surface Finish	Contents	Special Use?	Color
Sherwin Williams	Interior	Semi-gloss	Latex	------	Blue

Actions	Materials
2. Tell the learners that they will be working with their groups to read the labels of the cans in the **Handout** and decide where each word would go in the chart. Explain that not every paint label has all of the information to go in the chart.	*Paint On Sale Handout*
3. Do an example with the whole group, using the label on the paint can (the real one) in front of you. Ask for volunteers to tell you where each words fits in the chart. Write the word in the correct column on the board. Have learners work in small groups to read the labels from the **Handout** and write the words in the correct columns in the chart. Optionally, groups may refer to real paint can labels. While the other groups are working together, assist the beginner group in reading the labels and completing the chart. Note: You will want to explain that *alkyd* paint is the most common form of *oil-based* paint.	*Paint Can* *Paint On Sale Handout* *Paint Can Labels (Optional)*
4. After most groups have filled out the columns on their handouts, ask for volunteers to come to the board (one at a time) and write the words in the columns for one paint label. Tape the picture of the can next to the row of words from its label. Your chart will look something like the example.	*Paint On Sale Handout–Cut Up*

Manufacturer	Place to Use	Surface Finish	Contents	Special Use?	Color
Sherwin Williams	Interior	Semi-Gloss	Latex	------	Blue
Glidden	Interior	Flat	Enamel	Porch	White
Zinsser	Exterior	High-Gloss	Oil-Based	Ceiling	Base 1
Behr	Int/Ext	Satin	Acrylic	Base	-----
Behr	Int/Ext	Semi-Gloss	Water-Based	Base	-----
Behr	Int/Ext	Eggshell	Latex	Base	-----

Must use paint remover to clean brushes

Washes away with water

5. After volunteers have written the terms in the columns for five or six paint labels, point to the *Surface Finish* or *Gloss* column.	

Actions	Materials
Ask learners to tell you how to list these words in order of the degree of glossiness. Make a new list of the finish types, in order of glossiness. You will write this list on the board: flat, matte, eggshell, satin, semi-gloss, high-gloss Note: Some paint companies have an additional finish, *sateen*, which falls between satin and semi-gloss.	
6. In the *Contents* category, ask the learners to tell you which words refer to the same general type of paint. After the learners have responded, draw a circle around *enamel* and *oil-based* in one color marker and then another circle around *acrylic*, *water-based* and *latex* in another color marker. (See example chart above.) Ask learners to tell you an important difference between these two types of paint. Write their correct responses on the board. Ask learners what type of paint, *oil* or *latex*, they prefer to use and why.	

Actions	Materials
Activity #2: ***Calculating Paint Surfaces*** 1. Tell learners that after choosing the paint colors and sheen, the next important step in a paint project is to calculate how much paint you need. Explain that in this part of the lesson they will learn and practice the steps in calculating the number of gallons of paint a painter needs for each job.	
2. Have learners get into groups of three. Give each learner the **Paint Calculation Practice Handout**. Read the terms for the dimensions of a structure and have the learners repeat each word after you.	***Paint Calculation Practice Handout***
3. Check that all learners understand the meanings of the terms and their use in the illustrations on the **Handout**.	***Paint Calculation Practice Handout***
4. Tell the learners to look at the instructions for calculating paint area on the **Paint Calculation Practice Handout**. Have several strong readers read the instructions, each taking one step to read. Be sure that the learners are placing the stress on the correct syllables in words such as ***perimeter***, ***circumference***, ***dimensions***, and ***multiply***. If learners have difficulty doing this, tap the stress pattern on the table as you say each word, and then have the learners do the same.	***Paint Calculation Practice Handout***
5. Ask learners to individually calculate each step and then check their answers with the other members. Ask for volunteers to tell you the correct result for each step and write that number in the correct blank in the transparency. Ask higher level group members explain their correct answers to any members that need further clarification.	***Paint Calculation Practice–Overhead***
6. Have groups complete the calculations for the painted surface area and number of gallons in ***Practice B*** on the **Paint Calculation Practice Handout**. Circulate to assist where needed.	***Paint Calculation Practice Handout***

Building on the Foundation
Practicing the New Language

Actions	Materials
Activity #3: **Estimating Gallons of Paint**	*How Much Paint Will You Need? Handout A*
Match learners at the same language level to work together in pairs. Give each pair a version of the **How Much Paint Will You Need? Handout**, **A** for beginning learners, **B** for mid-level learners, and **C** for higher level learners.	*How Much Paint Will You Need? Handout B*
Have the pairs follow the steps they practiced in *Activity #2* to determine the estimated number of gallons of paint they will need to paint the interior of the house pictured in their handout.	*How Much Paint Will You Need? Handout C*
Optional Extension: Explaining Calculations:	
Have each pair find a second pair with a different house example to form a new group. Each pair should sit directly across from the other.	
Referring to the picture of their houses, each pair will explain their calculations to the other pair. One partner explains *Steps 1-3* and the other partner explains *Steps 4-6*.	
After each pair has finished their explanation, the learners in the other pair can ask questions and make suggestions or other comments.	
Circulate to assist groups as needed.	
As a whole group, discuss any questions or comments learners have.	

Finishing Work
Extension or Out-of-Class Practice

Actions	Materials
1. Learners can practice calculating the square footage to paint for other house plans they find at the same e-plan sites listed on their copy of the **How Much Paint Will You Need? Handout**.	*How Much Paint Will You Need? Handout*
2. Learners can ask a salesperson at a local paint store to demonstrate the use of an electronic paint calculator.	
3. Learners calculate the number of gallons of paint needed to paint the walls of rooms in their homes that they would like to paint.	

THE VIRGINIA ADULT LEARNING RESOURCE CENTER

Virginia Commonwealth University

**Painting
Lesson Three: Buying Paint**

Facilitator Materials

PAINT ON SALE 50% OFF

Activity #1: Reading Paint Labels

Manufacturer	Place to Use	Surface Finish	Contents	Special Use?	Color
Old Time	------	-----	Alkyd Enamel	Porch & Floor	Richmond Red
Renewal	Exterior	------	Latex	Floor	Annapolis Blue
Old Time	Exterior	------	Water-Based	Primer	White
Cover All		------	Alkyd	Primer	------
In Style	Exterior	Semi-Gloss	Latex	------	White
Express Yourself	Interior	Flat	Latex	------	Salmon
Clean + Bright	Interior	Satin	------	Mildew Proof	-----
Like New	Interior	Flat	-----	Ceiling Paint	Bright White
American Heritage	Interior	Satin	Acrylic	Wall and Trim	-----
Renewal	Interior	Semi-Gloss	Acrylic Enamel	------	------
Cover All	Exterior	Satin	-----	House and Trim	Capital Grey
New Home	-----	High Gloss	Enamel	Metal & Wood	Shenandoah Green
Wild Tangent	Interior	Matte	Latex	------	Tahiti Green
American Heritage	Exterior	Flat	Latex	Base 1	------
Clean + Bright	-----	Semi-Gloss	------	Kitchen and Bath	Off White

Activity #2: Paint Calculation Practice

Practice A Instructions

To find out how much paint you need to paint the exterior of a structure, you need to know the **dimensions** of the structure. These are **the width**, **the depth**, and **the height** of the structure.
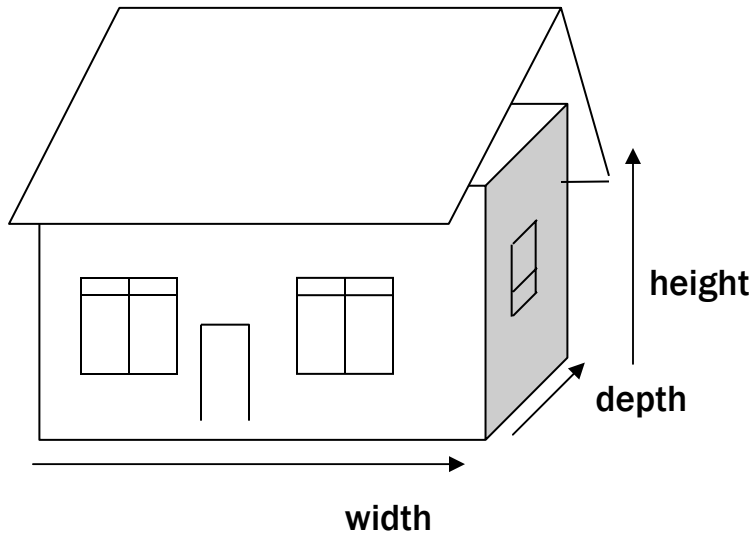
Sample Dimensions

Width	55'
Depth	30'
Height	38'

Step 1   <u>Add</u> the width and depth of the four sides of the structure to get the **perimeter** or the circumference of the structure.

front width **+** right depth **+** back width **+** left depth = perimeter or
circumference

55' +   30'   +   55' + 30' = 170'

Step 2   <u>Multiply</u> the **perimeter** by the height of the structure to get **the total surface area** of the outside walls you will paint.

170' **x** 38' = **6460 sq ft**

Step 3 <u>Count</u> the **standard windows**. Multiply this number by 15 sq ft.

Count the **large windows**. Multiply this number by 21 sq ft.

Count the **single doors**.   Multiply this number by 25 sq ft.

Count the **double doors**.   Multiply this number by 40 sq ft.

Non-painted area in sq ft

standard windows	4	x	15 sq ft =	**60**
large windows	4	x	21 sq ft. =	**84**
single doors	2	x	25 sq ft =	**50**
double doors	1	x	40 sq ft. =	**+ 40**
	Non-painted area in sq ft			**234**

Step 4 **Add** the number of square feet for all of the windows and doors.

Step 5 **Subtract** the **total number of square feet of non-painted areas from** the **total surface area** that you will paint.

Total Surface Area   6460 sq ft
Non-painted Area   **-   234** sq ft
Paint Surface Area   **6226** sq ft

Step 6 **Divide** the paint surface area **by 400 sq ft.** (One gallon of paint covers about 400 sq ft.)
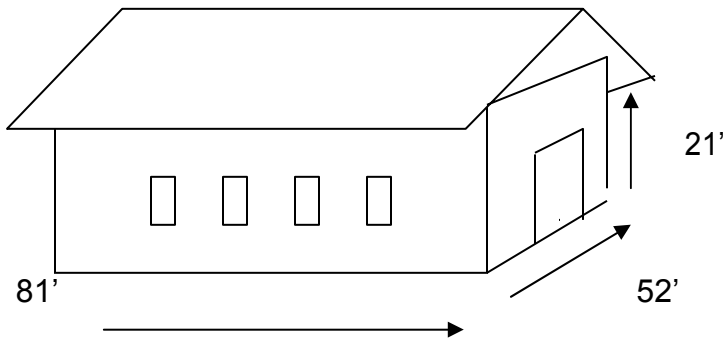
$$400 \sqrt{6226}$$

Number of gallons of paint needed: **15.5** gal

Practice B Instructions

Do this practice together with your group.

Calculate the number of gallons you need to paint the sides of this building.

Step 1 <u>Add</u> the width and depth of the four sides of the structure to get the **perimeter** or the circumference of the structure.

front width **+** right depth **+** back width **+** left depth **=** perimeter or
circumference

<u>**81**</u> ft + <u>**52**</u> ft <u>**81**</u> ft + <u>**52**</u> = <u>**266**</u> ft

Step 2 <u>Multiply</u> the **perimeter** by the height of the structure to get **the total surface area** of the outside walls you will paint.

<u>**266**</u> ft **x** <u>**21**</u> ft = <u>**5586**</u> sq ft

Step 3 <u>Count</u> the **standard windows**. Multiply this number by 15 sq ft.

Count the **large windows**. Multiply this number by 21 sq ft.

Count the **single doors**.   Multiply this number by 25 sq ft.

Count the **double doors**.   Multiply this number by 40 sq ft.

Unpainted area in sq ft

Standard windows (left side)	8x15 sq ft=120
Large windows (right side)	2x21 sq ft=42
Single doors (right side)	1x25 sq ft=25
Double doors (front and back)	2x40 sq ft=80

Unpainted area in sq. ft 267

Step 4   <u>**Add**</u> the number of square feet for all of the windows and doors.

Step 5   <u>**Subtract**</u> the **total number of square feet of unpainted areas** <u>from</u> the **total surface area** that you will paint.

Total Surface Area   **5586** sq ft
Unpainted Area   **- 267** sq ft
Paint Surface Area   **5319**

Step 6   <u>**Divide**</u> the paint surface area <u>**by 400 sq ft.**</u> (One gallon of paint covers about 400 sq ft.)

$400 \sqrt{\overline{\textbf{5319}}}$

Number of gallons of paint needed: <u>**13.3**</u> gal

Activity #3: How Much Paint Will You Need?

Handout A

House #1 "Simply the Best"

front view

rear view

DECK

seat

spa

(cathedral ceiling)
MASTER
BED RM.
14-0 x 17-0

master
bath

skylights

walk-in
closet

PORCH

arched window above door

BRKFST.
11-4 x 8-0

up

storage

(cathedral ceiling)

BED RM.
11-4 x 11-0

cl

lin.

bath

fireplace

GREAT RM.
15-4 x 18-8

KITCHEN

11-4 x
12-9

cl

d

w

UTIL.

pd.
rm.

GARAGE
23-4 x 23-8

BED RM.
13-8 x 11-8

cl

FOYER
7-4 x
11-8

cl

DINING
14-8 x 11-8
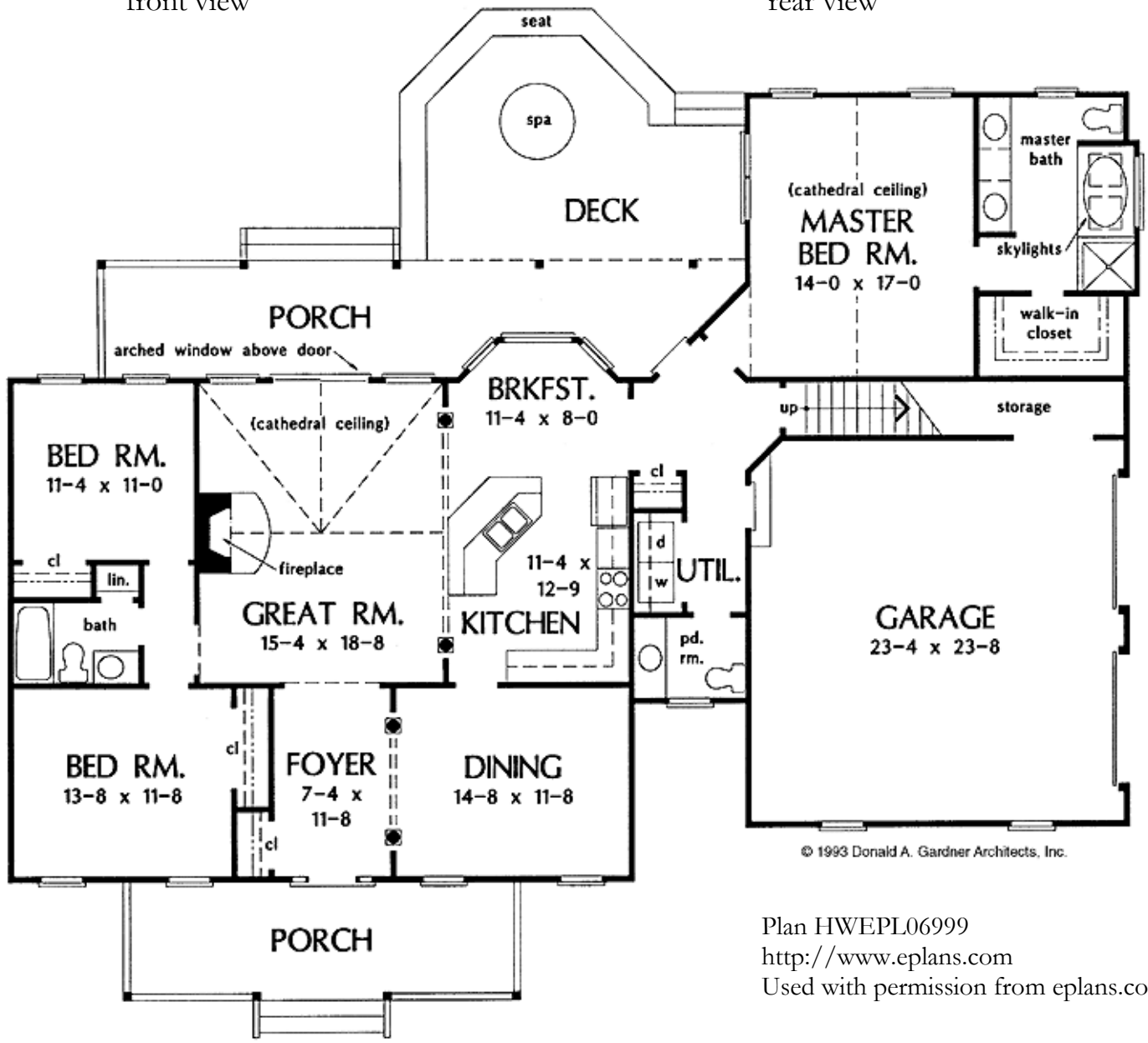
© 1993 Donald A. Gardner Architects, Inc.

PORCH

Plan HWEPL06999
http://www.eplans.com
Used with permission from eplans.com

Painting
Buying Paint

Virginia Adult Learning Resource Center

How Much Paint Will You Need? Handout A
Lesson Three Facilitator Materials

Instructions: Estimate the number of gallons of paint you will need to paint the walls in these rooms. The ceiling height in these rooms is 9.0 ft.

- the three bedrooms
- the dining room
- the foyer

Room	Total room area in sq ft	Unpainted areas in sq ft	Room area to be painted in sq ft	Number of gallons needed
Bedroom #1*	558	85	473	1.2
Bedroom #2	420	55	365	.9
Bedroom #3	456	95	361	.9
Foyer	342	90	252	.6
Dining room	384	95	289	.7
			Total gallons	4.3

*See Facilitator Notes on next page for detailed solving information and special considerations.

Facilitator Notes

Bedroom #1   (Master Bedroom)

Perimeter: $14 + 17 + 14 + 17 = 69$ ft x 9' ceilings = 558 sq ft surface area (Total room area)

4 windows x 15 sq ft   = 30 sq ft   *There are a variety of ways to address the alcove in the bottom left
1 single door x 25 sq ft = 25 sq ft   corner of the master bedroom. The simplest, used here, is to count the
Unpainted areas   = 85 sq ft   bottom corner of the bedroom as solid (do not subtract the main door).
                                         The "extra paint" can be used for the alcove walls.

558 - 85 = 473 sq ft (Room area to be painted)   473/400 = 1.1825 or 1.2 gallons of paint needed**

Bedroom #2   (Topmost Bedroom, Left)

Perimeter: $11^4 + 12 + 11^4 + 12 = 46^8$ ft   *For some rooms, calculating surface area will require conversion
46^8 x 12 (inches in a foot) = 560"   between feet and inches (the method used throughout these notes).
9' ceilings x 12 inches in a foot = 108 in^2 You may choose, especially with beginning students, to introduce
560" x 108" = 60, 480 in^2 (Total room area)   the concepts of *rounding* and *estimation*. Students could round
12" x 12" = 144" per sqare foot 46^8 ft to 47 feet, resulting in a Total room area of 423 sq ft. For
60, 480 / 144 = 420 sq ft (Total room area)   closer estimation, be sure to tell students to round after adding the
2 windows x 15 sq ft   = 30 sq ft   perimeter (46^8 becomes 47; rather than 11^4 becomes 11, giving a
1 single door x 25 sq ft= 25 sq ft   perimeter of 46 and a Total room area of only 414 sq ft.) Rounding
1 double door x 40sq ft= 40 sq ft   will result final answers slightly different from those given in the
Unpainted areas   = 95 sq ft   preceding chart.
420 - 95 = 325 sq ft (Room area to be painted)   325/400 = .8125 or .8 gallons of paint needed**

Bedroom #3   (Lower Bedroom, Bottom Left Corner)

Perimeter: $13^8 + 11^8 + 13^8 + 11^8 = 48^{32} = 50^8$ ft = 608" x 108" ceilings = 65,664 in^2 = 456 sq ft (Total room area)
2 windows x 15 sq ft   = 30 sq ft
1 single door x 25 ft^2 = 25 sq ft   *Be sure learners remember to include closet doors in their
1 double door x 40 ft^2 = 40 sq ft   calculations.
Unpainted areas   = 95 sq ft
456 - 95 = 361 sq ft (Room area to be painted)   361/400 = .9025 or .9 gallons of paint needed**

Foyer

Perimeter: $7^4 + 11^8 + 7^4 + 11^8 = 36^{24} = 38$ ft x 9' ceilings = 342 sq ft surface area (Total room area)
2 single doors x 25 ft^2 = 50 sq ft
1 double door x 40 ft^2 = 40 sq ft
Unpainted areas   = 90 sq ft
342 - 90 = 252 sq ft (Room area to be painted)   252/400 = .63 or .6 gallons of paint needed**

Dining Room

Perimeter: $14^8 + 11^8 + 14^8 + 11^8 = 40^{32} = 42^8$ ft = 512" x 108" ceilings = 55,296 in^2 = 384 sq ft (Total room area)
2 windows x 15 sq ft = 30 sq ft   **General Note on Rounding: Rounding to the tenth
1 single door x 25 ft^2 = 25 sq ft   decimal point is recommended. Rounded scores will differ
1 double door x 40 ft^2 = 40 sq ft   slightly from unrounded scores. For example, rounding to
Unpainted areas   = 95 sq ft   the tenth place in this activity gives a total of 4.2 gallons
384 - 95 = 289 sq ft (Room area to be painted)   of paint needed, while using the unrounded decimals
289/400 = .7225 or .7 gallons of paint needed**   provided by a common hand calculator will result in a total
                                         of 4.25 or 4.2 gallons of paint needed.

Activity #3: How Much Paint Will You Need?

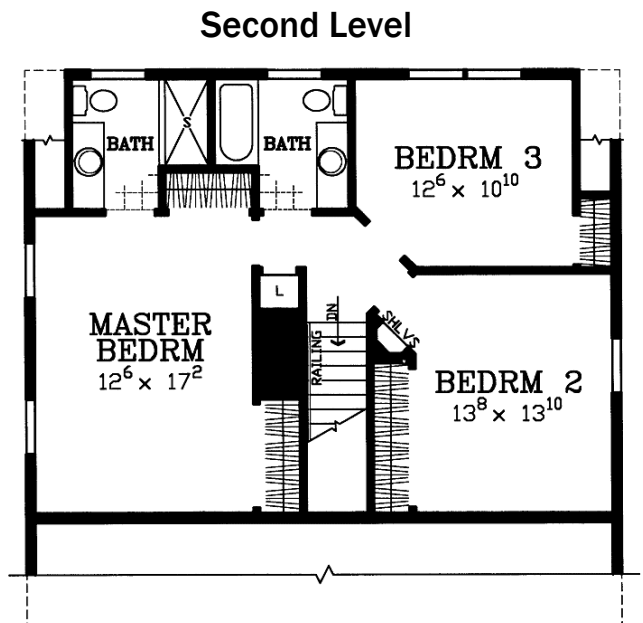# Handout B   House #2 Cape Cod Charmer

front view

rear view
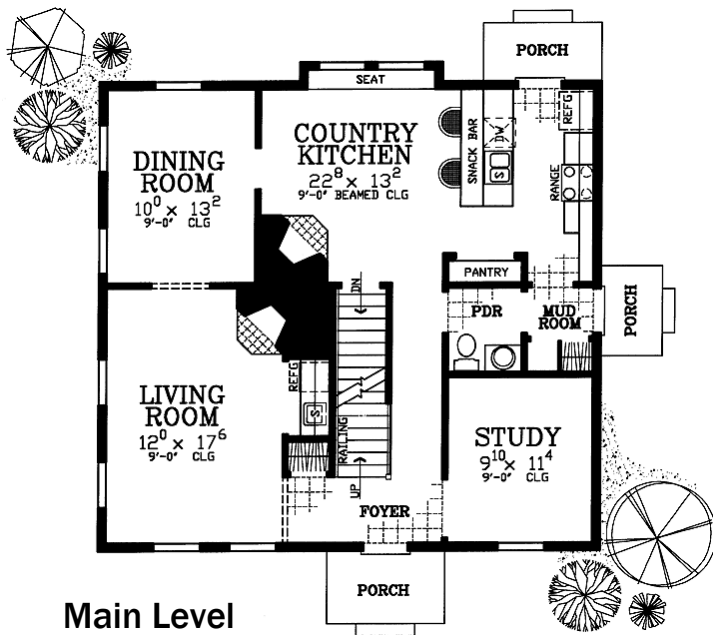
Main Level

Second Level

Painting
Buying Paint   Virginia Adult Learning Resource Center

How Much Paint Will You Need? Handout B
Lesson Three Facilitator Materials

Instructions: Estimate the number of gallons of paint you will need to paint these rooms. The ceiling height in each room is 9.0 ft.

- the living room
- the three bedrooms
- the study
- the dining room

Room	Total room area in sq ft	Unpainted areas in sq ft	Room area to be painted in sq ft	Number of gallons needed
Living room	**531**	**110**	**421**	1
Bedroom #1	**534**	**160**	**374**	.9
Bedroom #2	**495**	**80**	**415**	1
Bedroom #3	**427**[6]	**80**	**347**[6]	.9
Study	**381**	**40**	**341**	.9
Dining room	**417**	**95**	**322**	.8
			Total gallons	5.5

*See Facilitator Notes on next page for detailed solving information and special considerations.

Facilitator Notes

Living Room

Perimeter: $12 + 17^6 + 12 + 17^6 = 59$ ft x 9' ceilings = 531 sq ft (Total room area)

4 windows x 15 sq ft $\quad= 60$ sq ft $\qquad$ *See Facilitator Notes to **How Much Paint Will You Need?**

2 single door x 25 ft^2 $= 50$ sq ft $\qquad$ **Handout A** for notes on feet-to-inches conversion.

Unpainted areas $\qquad= 110$ ft

531 - 110 = 421 sq ft (Room area to be painted) $\qquad$ 361/400 = 1 gallon of paint needed**

Bedroom #1 $\qquad$ (Master Bedroom)

Perimeter: $12^6 + 17^2 + 12^6 + 17^2 = 49^4 = 712$" x 108" ceilings = 76,896 in^2 = 534 sq ft (Total room area)

2 windows x 15 sq ft $\quad= 30$ sq ft

2 single doors x 25 ft$^2 = 50$ sq ft $\qquad$ *Be sure learners remember to include closet doors in their

2 double doors x 40 ft$^2 = 80$ sq ft $\qquad$ calculations.

Unpainted areas $\qquad= 160$ sq ft

534 - 160 = 374 sq ft (Room area to be painted) $\qquad$ 374/400 = .9 gallons of paint needed**

Bedoom #2

Perimeter: $13^8 + 13^{10} + 13^8 + 13^{10} = 52^{36} = 55$ x 9' ceilings = 495 sq ft (Total room area)

1 window x 15 sq ft $\quad= 15$ sq ft

1 single door x 25 ft$^2 = 25$ sq ft 1

double door x 40 ft$^2 = 40$ sq ft

Unpainted areas $\qquad= 80$ sq ft

495 - 80 = 415 sq ft (Room area to be painted) $\qquad$ 415/400 = 1 gallon of paint needed**

Bedroom #3

Perimeter: $12^6 + 10^{10} + 12^6 + 10^{10} = 49^4 = 712$" x 108" ceilings = 76,896 in^2 = 427^6 sq ft (Total room area)

2 windows x 15 sq ft $\quad= 30$ sq ft

2 single doors x 25 ft$^2 = 50$ sq ft

Unpainted areas $\qquad= 80$ sq ft

427.5 - 80 = 347.5 sq ft (Room area to be painted) $\qquad$ 347.5/400 = .9 gallons of paint needed**

Study

Perimeter: $9^{10} + 11^4 + 9^{10} + 11^4 = 40^{28} = 42^4 = 508$" x 108" ceilings = 54,864 in^2 = 381 sq ft (Total room area)

1 window x 15 sq ft $\quad= 15$ sq ft

1 single door x 25 ft$^2 = 25$ sq ft

Unpainted areas $\qquad= 40$ sq ft

381 - 40 = 341 sq ft (Room area to be painted) $\qquad$ 341/400 = .9 gallons of paint needed**

Dining Room

Perimeter: $12 + 17^6 + 12 + 17^6 = 59$ ft x 9' ceilings = 417 sq ft (Total room area)

4 windows x 15 sq ft $\quad= 60$ sq ft $\qquad$ **General Note on Rounding: Paint gallons have been

2 single doors x 25 ft$^2 = 50$ sq ft $\qquad$ rounded to the tenth place. Rounded scores will differ

Unpainted areas $\qquad= 95$ sq ft $\qquad$ slightly from unrounded scores. For example, this activity

417 - 95 = 322 sq ft (Room area to be painted) $\qquad$ results in the round figure of 5.5 paint gallons needed, while

322/400 = .8 gallons of paint needed** $\qquad$ using the unrounded decimals provided by a common hand

calculator results in 5.55125, or 5.6 paint gallons needed.

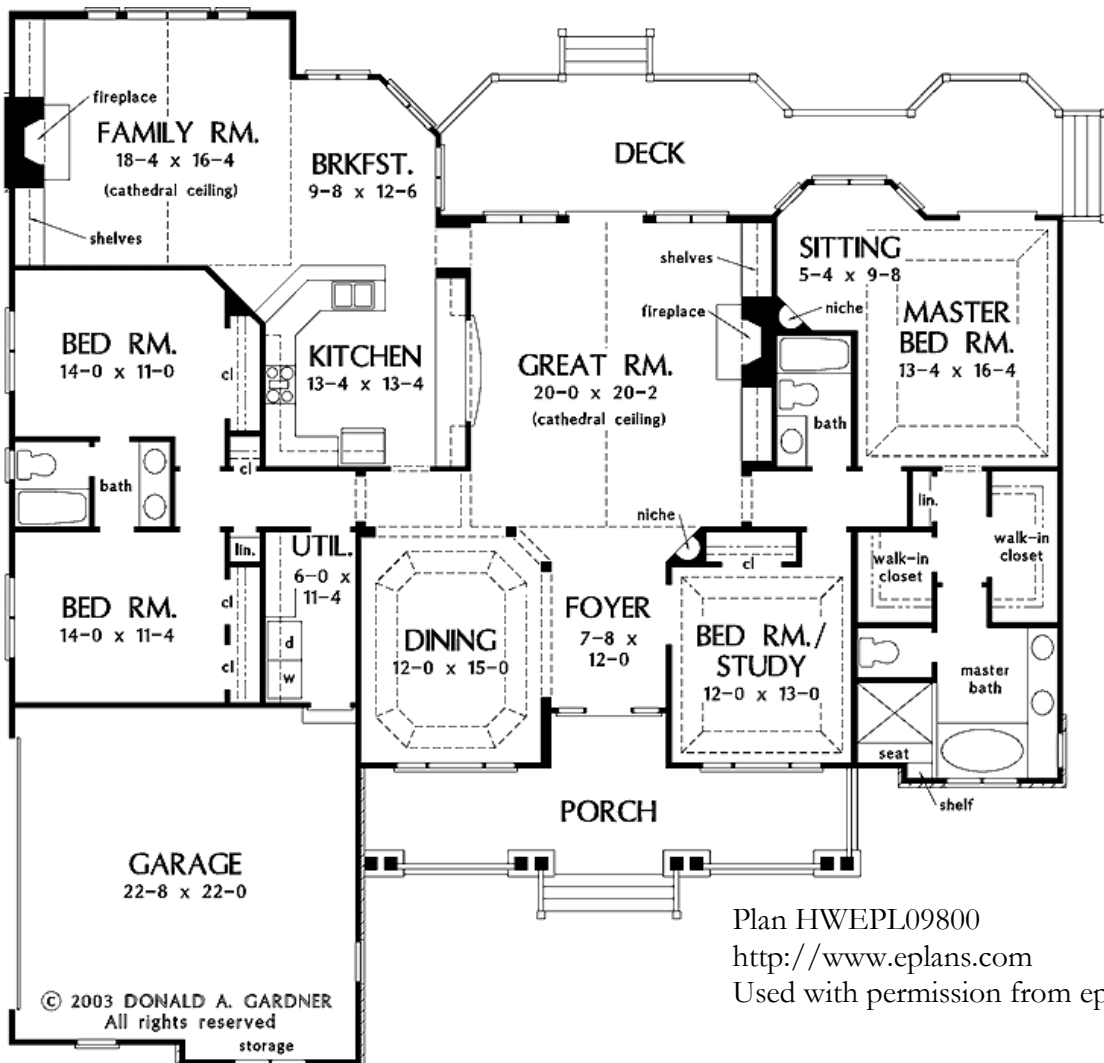Painting $\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad\qquad$ How Much Paint Will You Need? Handout B

Buying Paint $\qquad\qquad\qquad\qquad$ Virginia Adult Learning Resource Center $\qquad\qquad$ Lesson Three Facilitator Materials

Handout C 🏠🏠🏠 House #3 Craftsman Character

Plan HWEPL09800
http://www.eplans.com
Used with permission from eplans.com

Painting
Buying Paint   Virginia Adult Learning Resource Center

How Much Paint Will You Need? Handout C
Lesson Three Facilitator Materials

Instructions: Estimate the number of gallons of paint you will need to paint the walls in these rooms. The ceiling height in each room is 9.0 ft.

- the living room (great room)
- two bedrooms
- master bedroom
- the bedroom/study
- the dining room

Room	Total room area in sq ft	Unpainted areas in sq ft	Room area to be painted in sq ft	Number of gallons needed
Living room	543	165	378	.9
Bedroom #1	450	120	330	.8
Bedroom #2	456	130	326	.8
Master Bedroom	534	90	444	1.1
Bedroom/Study	450	101	349	.9
Dining room	486	156	330	.8
			Total gallons	5.3

* See Facilitator Notes on next page for detailed solving information and special considerations.

<h1 style="text-align:center">Facilitator Notes</h1>

Living Room   (Great Room)

Perimeter: $20 + 20^2 + 20^2 = 60^{40} = 724"$ x $108"$ ceilings = $78,192$ in^2 = 543 sq ft (Total room area)

4 windows x 15 sq ft = 60 sq ft	*There are a variety of approaches in deciding how to calculate the
1 single door x 25 ft^2 = 25 sq ft	surface area of the Great Room, taking into account the openness of
2 double doors x 40 ft^2 = 80 sq ft	the design. Here, one 20' wall (the lower wall) has been left out of
Unpainted areas = 165 sq ft	the calculations. Because there is, in fact, some paintable area
543 - 165 = 378 sq ft (Room area to be painted)	on the lower wall, one 25 ft^2 door has also been left out of
378/400 = .9 gallons of paint needed**	calculation (failing to subtract the door provides "extra paint" for the

segments of the lower wall). The fireplace and the bar leading to the kitchen have been treated as 40 ft^2 doors. The shelves have not been included in the "Unpainted areas" calculation.

Bedoom #1   (Topmost Bedroom, Left)

Perimeter: $14 + 11 + 14 + 11 = 50$ ft x 9' ceilings = 450 sq ft (Total room area)

2 windows x 15 sq ft   = 30 sq ft
2 single doors x 25 ft^2 = 50 sq ft   *See Facilitator Notes to **How Much Paint Will You Need?**
1 double door x 40 ft^2 = 40 sq ft   **Handout A** for notes on feet-to-inches conversion.
Unpainted areas   = 120 sq ft
450 - 120 = 330 sq ft (Room area to be painted)   330/400 = .8 gallons of paint needed**

Bedoom #2   (Lower Bedroom, Left)

Perimeter: $14 + 11^4 + 14 + 11^4 = 50^8 = 608"$ x $108"$ ceilings = $65,664"$ = 456 sq ft (Total room area)

2 windows x 15 sq ft   = 30 sq ft   *Be sure learners remember to include closet doors in their
4 single door x 25 ft^2 = 100 sq ft   calculations.
Unpainted areas   = 130 sq ft
495 - 80 = 415 sq ft (Room area to be painted)   415/400 = 1 gallon of paint needed**

Master Bedroom

Perimeter: $13^4 + 16^4 + 13^4 + 16^4 = 58^{16} = 59^4 = 712"$ x $108"$ ceilings = $76,896$ in^2 = 534 sq ft (Total room area)

2 single door x 25 ft^2 = 50 sq ft   *There are a variety of ways to approach this bedroom's
1 double door x 40 ft^2 = 40 sq ft   convergence with the sitting room. You may want to teach
Unpainted areas   = 40 sq ft   advanced learners how to subtract the dimensions of the
534 - 90 = 444 sq ft (Room area to be painted)   sitting room dimensions from the left and upper walls of the
444/400 = 1.1 gallons of paint needed**   bedroom. In these calculations, the sitting room has been
ignored; the left corner of the bedroom is treated as paintable area. Another alternative is to estimate the missing corner. For example, estimating the missing area to be approximately the area of three double doors would yield an Unpainted areas total of 210 sq ft, with room area to be painted 324 ft, or .8 gallons. This would impact the overall totals, yielding a final result of 5 rather than 5.3 gallons of paint needed.

Bedoom/ Study

Perimeter: 12 + 13 + 12 + 13= 50 ft x 9' ceilings = 450 sq ft (Total room area)
2 windows x 15 sq ft   = 30 sq ft
1 large window x 21 ft^2= 21 sq ft 2
single doosr x 25 ft^2 = 50 sq ft
Unpainted areas   = 101 sq ft
450 - 101 = 349 sq ft (Room area to be painted)   349/400 = .9 gallons of paint needed**

Dining Room

Perimeter: 12 + 15 + 12 + 15 = 54 ft x 9' ceilings = 486 sq ft (Total room area)
2 windows x 15 sq ft   = 30 sq ft
1 large window x 21 ft^2= **21 sq ft** 1
single door x 25 ft^2 = 25 sq ft 2
double doors x 40 ft^2 = **80 sq ft**
Unpainted areas   = 156 sq ft
486 - 156 = 330 sq ft (Room area to be painted)   330/400 = .8 gallons of paint needed**

**General Note on Rounding: Paint gallons have been rounded to the tenth place. Rounded scores will differ slightly from unrounded scores. For example, this activity results in the round figure of 5.3 paint gallons needed, while using the unrounded decimals provided by a common hand calculator results in 5.3925 or 5.4 paint gallons needed.