



THE VIRGINIA ADULT LEARNING RESOURCE CENTER

V i r g i n i a C o m m o n w e a l t h U n i v e r s i t y

Painting **Lesson Three: Buying Paint** **Facilitator Guide**

Building Basics was paid for under an EL Civics grant from the U. S. Department of Education administered by the Virginia Department of Education. It was paid for under the Adult Education and Family Literacy Act of 1998; however, the opinions expressed herein do not necessarily represent the position or policy of the U. S. Department of Education, and no official endorsement by the U. S. Department of Education should be inferred. This document was designed and created by the Virginia Adult Learning Resource Center at Virginia Commonwealth University, 817 West Franklin Street, Suite 221, P.O. Box 842037, Richmond, VA 23284-2020. It may be reproduced for nonprofit, educational purposes only.

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
<p>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.</p> <ul style="list-style-type: none"> ➤ Where is this man? ➤ Why is he there? ➤ What is he feeling or thinking? ➤ Have you ever felt like the man in this picture? ➤ If you need paint, where do you go to buy it? ➤ What kind of paint were you looking for? ➤ Where was it? ➤ Was it easy to find? ➤ Has anyone ever bought the wrong paint? ➤ What happened? ➤ Can you return paint to the store if you don't like it? <p>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.</p>	<p>Lost in the Paint Aisle-Overhead</p>
<p>Activity #1: Reading Paint Labels</p> <p>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 <i>gloss</i> and <i>finish</i>.</p>	<p>Paint On Sale Handout</p> <p>Complete Color Palette</p> <p>Paint Can</p>

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 <i>alkyd</i> paint is the most common form of <i>oil-based</i> 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.	
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Actions	Materials
<p>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:</p> <p style="text-align: center;">flat, matte, eggshell, satin, semi-gloss, high-gloss</p> <p>Note: Some paint companies have an additional finish, <i>sateen</i>, which falls between satin and semi-gloss.</p>	
<p>6. In the <i>Contents</i> 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 <i>enamel</i> and <i>oil-based</i> in one color marker and then another circle around <i>acrylic</i>, <i>water-based</i> and <i>latex</i> 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, <i>oil</i> or <i>latex</i>, they prefer to use and why.</p>	

Actions	Materials
<p>Activity #2: Calculating Paint Surfaces</p> <p>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.</p>	
<p>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.</p>	<p>Paint Calculation Practice Handout</p>
<p>3. Check that all learners understand the meanings of the terms and their use in the illustrations on the Handout.</p>	<p>Paint Calculation Practice Handout</p>
<p>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 <i>perimeter</i>, <i>circumference</i>, <i>dimensions</i>, and <i>multiply</i>. 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.</p>	<p>Paint Calculation Practice Handout</p>
<p>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.</p>	<p>Paint Calculation Practice–Overhead</p>
<p>6. Have groups complete the calculations for the painted surface area and number of gallons in <i>Practice B</i> on the Paint Calculation Practice Handout. Circulate to assist where needed.</p>	<p>Paint Calculation Practice Handout</p>

Building on the Foundation Practicing the New Language



Actions	Materials
<p>Activity #3: <i>Estimating Gallons of Paint</i></p> <p>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.</p> <p>Have the pairs follow the steps they practiced in <i>Activity #2</i> to determine the estimated number of gallons of paint they will need to paint the interior of the house pictured in their handout.</p> <p>Optional Extension: Explaining Calculations:</p> <p>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.</p> <p>Referring to the picture of their houses, each pair will explain their calculations to the other pair. One partner explains <i>Steps 1-3</i> and the other partner explains <i>Steps 4-6</i>.</p> <p>After each pair has finished their explanation, the learners in the other pair can ask questions and make suggestions or other comments.</p> <p>Circulate to assist groups as needed.</p> <p>As a whole group, discuss any questions or comments learners have.</p>	<p><i>How Much Paint Will You Need? Handout A</i></p> <p><i>How Much Paint Will You Need? Handout B</i></p> <p><i>How Much Paint Will You Need? Handout C</i></p>

Finishing Work
Extension or Out-of-Class Practice



Actions	Materials
<ol style="list-style-type: none">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.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.	<i>How Much Paint Will You Need? Handout</i>



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Virginia Commonwealth University

Painting
Lesson Three: Buying Paint

Facilitator Materials

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PAINT

HOLOGRAPHIC

3-D PUFFY SHINY GLOW IN THE DARK GLOW NEON

CLOSET LAUNDRY ROOM BATH ROOM

PURPLE BLUE BLACK WASH ROOM ALL NEW GREEN WHITE SCRUBBABLE

100% WASHABLE STUCCO

PAINT STUCCO TRICK

LATEX MASONARY SUPER PAINT

ALKYD OIL BASED PRIMER

TALKYD METAL

LIKE NEW STYLE OIL GLOSS PAINT

PAINT AISLE
all kinds!!
Good Luck!!

Hmmm...
So???

PAINT ALL KINDS

INTERIOR

TRIM EXTERIOR AMERIC INTER 100% AMERIC INTER 100%

FLAT LATEX

HIGH GLOSS

EGGSHELL

WHITE CREME IVORY

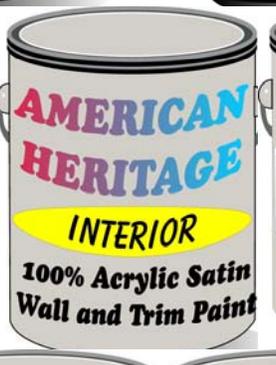
SHELLAC



Becky Ward-Noyan '66



**PAINT ON SALE
50% OFF**



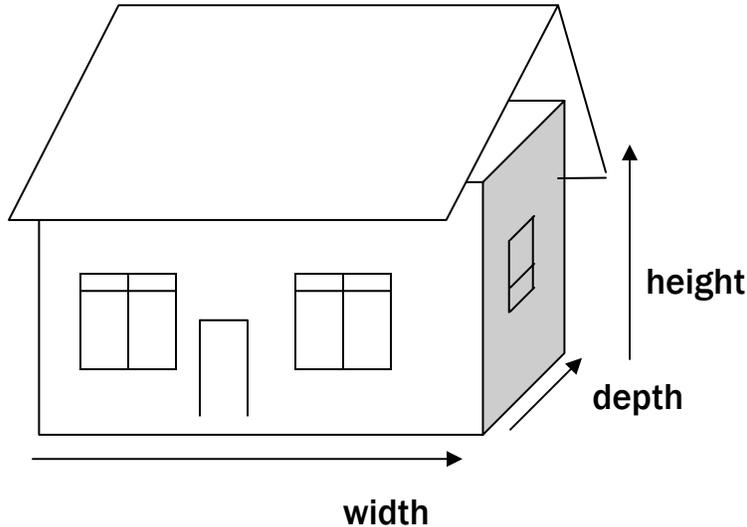
Activity #1: Reading Paint Labels

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 Add 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 Multiply the **perimeter** by the height of the structure to get **the total surface area** of the outside walls you will paint.

$$170' \times 38' = 6460 \text{ sq ft}$$

Step 3 Count 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.

$$\begin{array}{r} \text{Total Surface Area} \quad 6460 \text{ sq ft} \\ \text{Non-painted Area} \quad - \underline{234} \text{ sq ft} \\ \text{Paint Surface Area} \quad 6226 \text{ sq ft} \end{array}$$

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

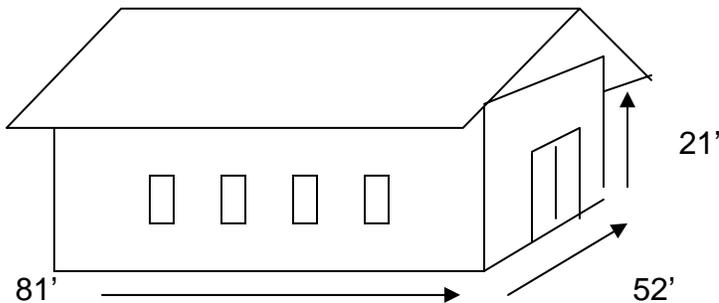
$$400 \sqrt{6226}$$



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 Add 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

$$\underline{81} \text{ ft} + \underline{52} \text{ ft} + \underline{81} \text{ ft} + \underline{52} = \underline{266} \text{ ft}$$

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

$$\underline{266} \text{ ft} \times \underline{21} \text{ ft} = \underline{5586} \text{ sq ft}$$

Step 3 Count 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)	8 x 15 sq ft =	120
large windows (right side)	2 x 21 sq ft. =	42
single doors (right side)	1 x 25 sq ft =	25
double doors (front & back)	2 x 40 sq ft. = +	80
	Unpainted area in sq ft	267

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 unpainted areas** from the **total surface area** that you will paint.

$$\begin{array}{r} \text{Total Surface Area} \quad \quad \quad \mathbf{5586} \text{ sq ft} \\ \text{Unpainted Area} \quad \quad \quad - \mathbf{267} \text{ sq ft} \\ \hline \mathbf{\text{Paint Surface Area}} \quad \quad \quad \mathbf{5319} \end{array}$$

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

$$400 \overline{) 5319}$$



Number of gallons of paint needed: **13.3** gal

Activity #3: How Much Paint Will You Need?

Handout A

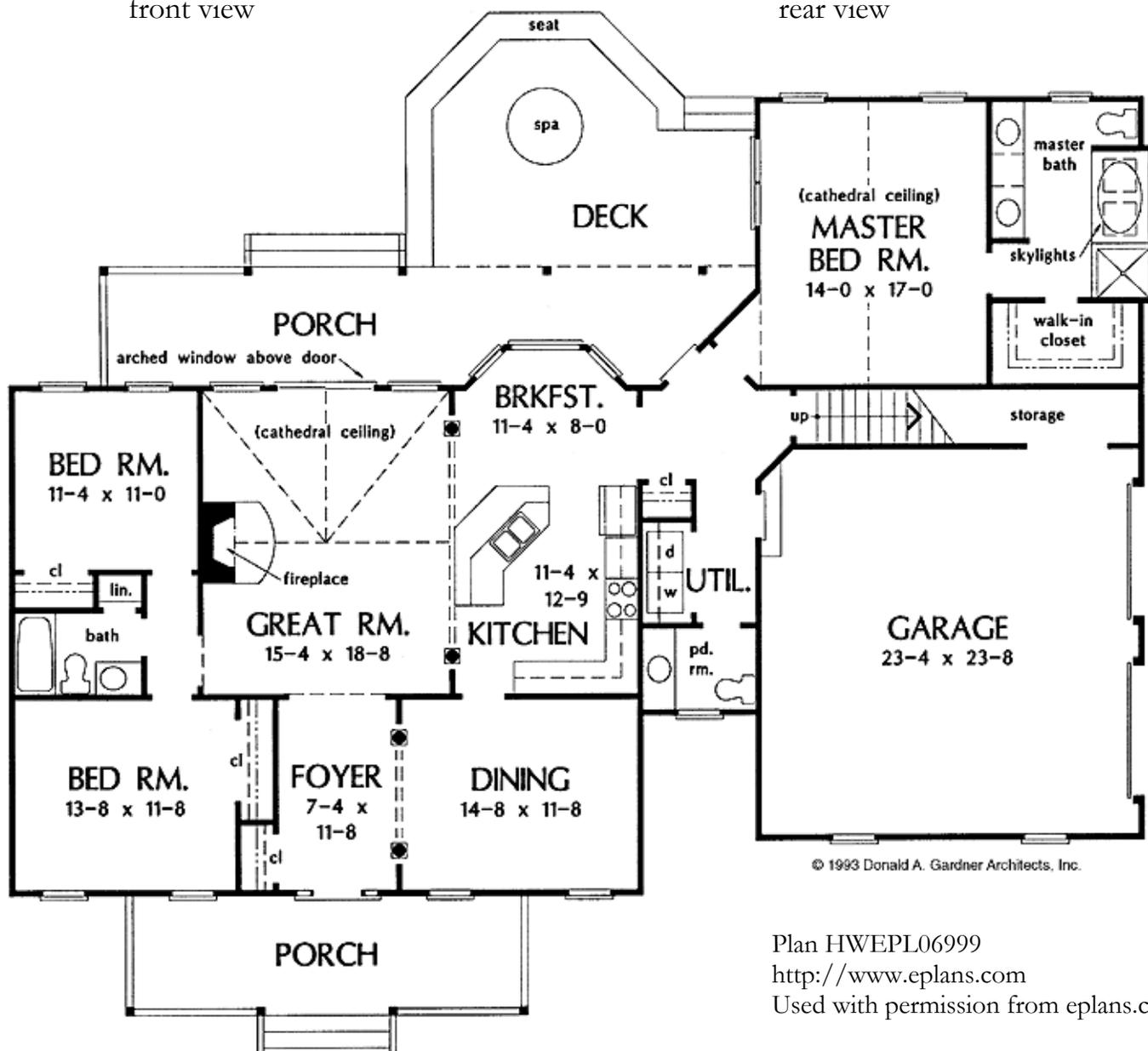
House #1 "Simply the Best"



front view



rear view



© 1993 Donald A. Gardner Architects, Inc.

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

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

1 single door x 25 sq ft = 25 sq ft

Unpainted areas = 85 sq ft

*There are a variety of ways to address the alcove in the bottom left corner of the master bedroom. The simplest, used here, is to count the 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

$46^8 \times 12$ (inches in a foot) = 560"

9' ceilings x 12 inches in a foot = 108 in²

$560" \times 108" = 60,480$ in² (Total room area)

$12" \times 12" = 144"$ per square foot

$60,480 / 144 = 420$ sq ft (Total room area)

2 windows x 15 sq ft = 30 sq ft

1 single door x 25 sq ft = 25 sq ft

1 double door x 40 sq ft = 40 sq ft

Unpainted areas = 95 sq ft

$420 - 95 = 325$ sq ft (Room area to be painted)

*For some rooms, calculating surface area will require conversion between feet and inches (the method used throughout these notes). You may choose, especially with beginning students, to introduce the concepts of *rounding* and *estimation*. Students could round 46^8 ft to 47 feet, resulting in a Total room area of 423 sq ft. For closer estimation, be sure to tell students to round after adding the perimeter (46^8 becomes 47; rather than 11^4 becomes 11, giving a perimeter of 46 and a Total room area of only 414 sq ft.) Rounding will result final answers slightly different from those given in the preceding chart.

$325/400 = .8125$ 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 in² = 456 sq ft (Total room area)

2 windows x 15 sq ft = 30 sq ft

1 single door x 25 ft² = 25 sq ft

1 double door x 40 ft² = 40 sq ft

Unpainted areas = 95 sq ft

$456 - 95 = 361$ sq ft (Room area to be painted)

*Be sure learners remember to include closet doors in their calculations.

$361/400 = .9025$ 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 ft² = 50 sq ft

1 double door x 40 ft² = 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 in² = 384 sq ft (Total room area)

2 windows x 15 sq ft = 30 sq ft

1 single door x 25 ft² = 25 sq ft

1 double door x 40 ft² = 40 sq ft

Unpainted areas = 95 sq ft

$384 - 95 = 289$ sq ft (Room area to be painted)

$289/400 = .7225$ or .7 gallons of paint needed**

**General Note on Rounding: Rounding to the tenth decimal point is recommended. Rounded scores will differ slightly from unrounded scores. For example, rounding to the tenth place in this activity gives a total of 4.2 gallons of paint needed, while using the unrounded decimals 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

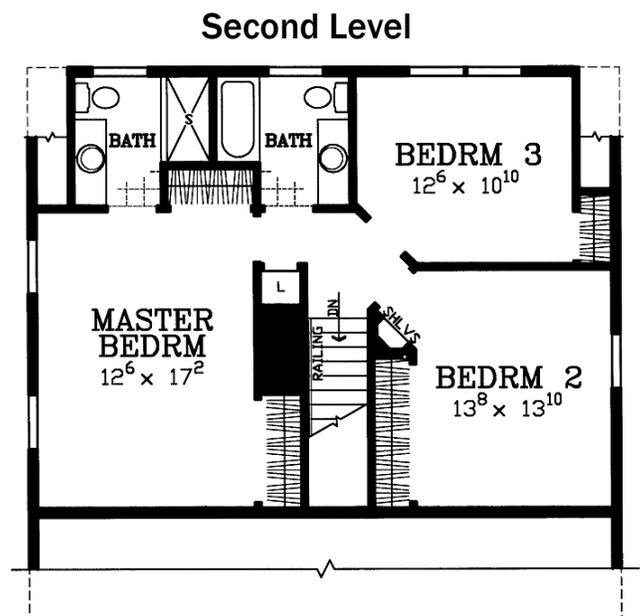
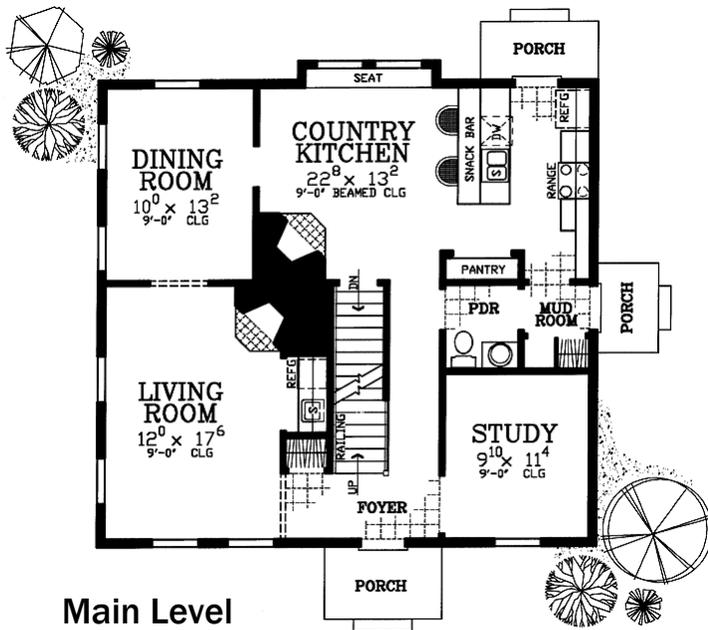
House #2 Cape Cod Charmer



front view



rear view



Plan HWEPL00515
<http://www.eplans.com>
 Used with permission from eplans.com

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 = 60 sq ft

*See Facilitator Notes to **How Much Paint Will You Need?**

2 single door x 25 ft² = 50 sq ft

Handout A for notes on feet-to-inches conversion.

Unpainted areas = 110 ft

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

Bedroom #1 (Master Bedroom)

Perimeter: $12^6 + 17^2 + 12^6 + 17^2 = 49^4 = 712$ " x 108" ceilings = 76,896 in² = 534 sq ft (Total room area)

2 windows x 15 sq ft = 30 sq ft

2 single doors x 25 ft² = 50 sq ft

*Be sure learners remember to include closet doors in their calculations.

2 double doors x 40 ft² = 80 sq ft

Unpainted areas = 160 sq ft

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

Bedroom #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 = 15 sq ft

1 single door x 25 ft² = 25 sq ft

1 double door x 40 ft² = 40 sq ft

Unpainted areas = 80 sq ft

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

Bedroom #3

Perimeter: $12^6 + 10^{10} + 12^6 + 10^{10} = 49^4 = 712$ " x 108" ceilings = 76,896 in² = 427⁶ sq ft (Total room area)

2 windows x 15 sq ft = 30 sq ft

2 single doors x 25 ft² = 50 sq ft

Unpainted areas = 80 sq ft

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

Study

Perimeter: $9^{10} + 11^4 + 9^{10} + 11^4 = 40^{28} = 42^4 = 508$ " x 108" ceilings = 54,864 in² = 381 sq ft (Total room area)

1 window x 15 sq ft = 15 sq ft

1 single door x 25 ft² = 25 sq ft

Unpainted areas = 40 sq ft

381 - 40 = 341 sq ft (Room area to be painted) $341/400 = .9$ 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 = 60 sq ft

2 single doors x 25 ft² = 50 sq ft

Unpainted areas = 95 sq ft

417 - 95 = 322 sq ft (Room area to be painted)

$322/400 = .8$ gallons of paint needed**

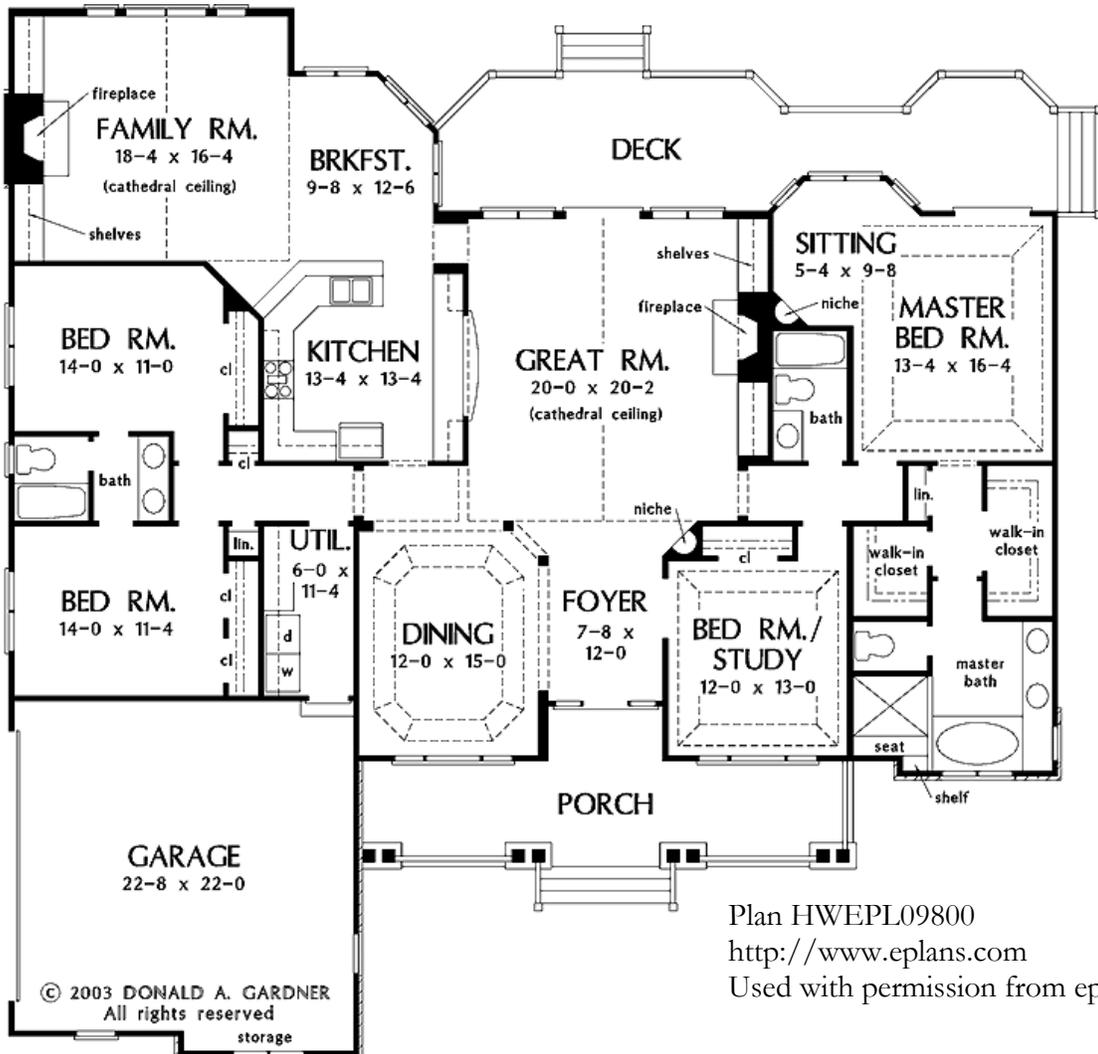
**General Note on Rounding: Paint gallons have been rounded to the tenth place. Rounded scores will differ slightly from unrounded scores. For example, this activity results in the round figure of 5.5 paint gallons needed, while using the unrounded decimals provided by a common hand calculator results in 5.55125, or 5.6 paint gallons needed.

Activity #3: How Much Paint Will You Need?

Handout C



House #3 Craftsman Character



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.

Facilitator Notes

Living Room (Great Room)

Perimeter: $20 + 20^2 + 20^2 = 60^{40} = 724'' \times 108''$ ceilings = 78,192 in² = 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 ft² = 25 sq ft surface area of the Great Room, taking into account the openness of
2 double doors x 40 ft² = 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 ft² 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 ft² doors. The shelves have not been included in the "Unpainted areas" calculation.

Bedroom #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 ft² = 50 sq ft *See Facilitator Notes to **How Much Paint Will You Need?**
1 double door x 40 ft² = 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**

Bedroom #2 (Lower Bedroom, Left)

Perimeter: $14 + 11^4 + 14 + 11^4 = 50^8 = 608'' \times 108''$ 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 ft² = 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: $13^4 + 16^4 + 13^4 + 16^4 = 58^{16} = 59^4 = 712'' \times 108''$ ceilings = 76,896 in² = 534 sq ft (Total room area)
2 single door x 25 ft² = 50 sq ft *There are a variety of ways to approach this bedroom's
1 double door x 40 ft² = 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.

Bedroom/ 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 ft² = 21 sq ft

2 single doors x 25 ft² = 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 ft² = 21 sq ft

1 single door x 25 ft² = 25 sq ft

2 double doors x 40 ft² = 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.