

WHITE LEAD PROMOTION PROGRAM**LEAD INDUSTRIES ASSOCIATION**

Greybar Building, 420 Lexington Avenue

New York, N. Y.

March 26, 1940

Bulletin No. 18Iowa State CollegeLesson Outline

To Members Supporting the White
Lead Promotion Program:

Attached please find copy of "Lesson Outlines Selecting and Applying Paints" by C. H. Van Vlack, based upon Circular #161 of the Iowa State College of Agriculture and Mechanic Arts.

So many requests had been received from instructors for Mr. Van Vlack's circular and for help in using it properly in class rooms that the attached outline was prepared in answer to the demand. Copies are being purchased by universities directly from the publisher.

In addition to Iowa State College, it is interesting to note that the following State Universities have ordered copies of the Circular #161 "Selecting and Applying Paints" for their own distribution, and at their own expense, the title page being changed to indicate a local origin:

Iowa
Maine
Nebraska
Nevada
New Hampshire

North Dakota
Rhode Island
South Dakota
Virginia
Wyoming

Mr. Van Vlack is now working on a leaflet on interior painting which is expected to be published some time this spring, under the auspices of the Iowa State College.

4--4

Very truly yours,

J. E. W. Doman

Secretary.



LESSON OUTLINES

SELECTING
and **APPLYING**
PAINTS

By
C. H. Van Vlack

This course is based upon Iowa State College Extension Circular No. 264—"Selecting and Applying Paints"

SUGGESTED

Lesson Outlines

For a Course in

Selecting and Applying Paints

By

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INTRODUCTION

The purpose of this outline is to provide a guide for the teacher which will assist in a more systematic organization of study materials for the efficient presentation of a course of instruction in the selection and application of exterior paints.

The lists of objectives and units are suggested in full. Only a sampling of lesson outlines is presented at this time. A full set of outlines will be available in booklet form if there is sufficient interest and demand. Many teachers prefer to formulate their own plans of a few alternative schemes or devices are at hand for comparison and evaluation. Accordingly, Unit IV—The ability to select a high quality paint which will provide long, low-cost service, is outlined after both the modified "Job Analysis" and "Problem Series" forms.

Either plan proceeds from the known to the unknown, and from the less difficult to the more difficult. It uses extensively the inductive development procedure. Pure memorization is avoided. Application of the principles learned is immediately provided. Throughout all the steps and procedures individual thinking is promoted. Thereby reasoning is developed in the same way one must reason to solve any problem in life's situations.

Exterior painting problems from the various units of this course may be used advantageously in schools where the course of study is built around the individual projects as is true in many states.

A COURSE IN SELECTING AND APPLYING PAINTS

GENERAL OBJECTIVES

- 1 To assist the student in learning to think and to solve the type of problems which confront him in everyday life.
- 2 To give the student an appreciation of the value and a greater satisfaction in working and living in the environment of better maintained and painted equipment and buildings.
- 3 To provide the student with an appreciation of the quality and service which good paint properly mixed and applied will yield.
- 4 To create an interest in and the ability to be of greater vocational service at home and in the community.
- 5 To develop in the student a knowledge of the importance of well kept and appointed homes and premises as related to home pride.

SPECIFIC OBJECTIVES

- 1 To create an interest in the importance of good paint in preventing unnecessary depreciation of farm buildings and equipment and in contributing to the beauty and attractiveness of the home and farmstead.
- 2 To develop the ability to determine when painting and repainting should be done.
- 3 To develop the ability to calculate the amount of paint required for the proposed paint job.
- 4 To develop the ability to select a high quality paint which will provide long, low cost service.
- 5 To develop the ability to formulate and prepare home-mixed paints.
- 6 To develop the ability to properly prepare the surface for painting.
- 7 To develop the ability to select and care for good paint equipment.
- 8 To develop the ability to avoid painting errors.
- 9 To develop the ability to apply paint in a workmanship-like manner.

THE UNITS

- I. An interest in the importance of good paint in preventing unnecessary depreciation of farm buildings and equipment and in contributing to the beauty and attractiveness of the home and farmstead, and an appreciation for what the paint film must withstand.
- II. The ability to determine when painting and repainting should be done.
- III. The ability to calculate the amount of paint required for the proposed paint jobs and to figure their costs.
- IV. The ability to select a high quality paint which will provide long, low-cost service.
 - Sub-ability 1—The ability to recognize that paint service varies greatly.
 - Sub-ability 2—The ability to evaluate the paint liquid (vehicle.)
 - Sub-ability 3—The ability to evaluate the paint pigments.
- V. The ability to formulate and prepare home-mixed paints.
- VI. The ability to prepare the surface for painting.
- VII. The ability to select and care for good paint equipment.
- VIII. The ability to avoid painting errors.
- IX. The ability to apply paint in a workmanship-like manner.

SUGGESTED LESSON PLAN**UNIT I**

Becoming interested in the importance of good paint in preventing unnecessary depreciation of farm buildings and equipment and in contributing to the beauty and attractiveness of the home and farmstead, and an appreciation for what the paint film must withstand.

Factual Material:

1. Interest in painting is founded on many bases, most important of which are: appearance, home pride and preservation of the surface of building materials.
2. Good paint properly applied returns a profit.
3. The paint film must withstand many varying conditions—rain, hot sunshine, temperatures below zero and contraction and expansion of the covered surface.

Objectives:

1. To create in the student a sense of added value in the well repaired and painted set of farm buildings and equipment.
2. To help the student to appreciate the importance of good paint in a program of economical maintenance of property.
3. To assist the student in sensing that important as are the economics of a consistent and thorough-going paint program, even more important are the aesthetic and cultural values.

Devices:

- I. Questions for study and classroom discussion.
- II. Field trip observations and reports. Survey sheets.
- III. Testing.

Notes:

SUGGESTED LESSON PLAN

UNIT IV

The ability to select a high quality paint which will provide long, low-cost service.

Sub-ability 1 (Determining that paints vary greatly in service).

Factual Material:

1. Some paints wear longer than others.
2. Paints must withstand many kinds of wear.
3. Good paints show wearing characteristics quite different from inferior paints.
4. There are many factors affecting the wearing qualities of paint, such as: exposure, kind of surface, treatment of surface before painting, painting practice, time of painting, number of coats, consistency of paint, kind of vehicle, kinds and combinations of pigments, thickness of coat, etc.

Objectives:

1. To get the student to recognize that paints vary in quality and durability.
2. To get the student to understand that quality paint returns a profit on the investment while inferior paints do not.
3. To have the student recognize that all exposures are not the same.
4. To have the student appreciate that many factors affect the durability of a paint.

Devices*:

- I. Questions for study and classroom discussion.
- II. Problems for individual solution.
- III. Laboratory exercises or field trip.
- IV. Individual or group surveys.
- V. Testing.

*For questions, problems and testing materials refer to Lesson Plan - Problems Series, pages 11 to 16 inclusive.

Notes:

SUGGESTED LESSON PLAN

UNIT IV

The ability to select a high quality paint which will provide long, low-cost service.

Subsidiary 2 (Evaluation of the liquid)

Factual Material:

1. Turpentine oil is the most important liquid in good paint.
2. Thinners and driers have a place in exterior paints under certain conditions. (Turpentine, a product of southern pine is used in paint for the purpose of providing penetration in the priming coat, good brushing consistency and the reduction of gloss when dry.)
3. So far as the liquid part of the paint is concerned, the greatest fraud is the inclusion of water.
4. The difference between turpentine and turpentine substitutes is important.
5. It takes expert knowledge to distinguish between low-grade and high-grade paint by appearance only.
6. Reference to the paint formula must be relied upon in paint selection.
7. Kerosene oil is coming into good use as paint liquid under certain conditions.
8. The proportion of volatile liquids is too great in many exterior paints.

Objectives:

1. To lead the student to recognize that paint liquids vary greatly in composition and therefore in quality.
2. To encourage the student to rely upon an evaluation of the formula in paint selection.
3. To help the student to gain such an understanding and appreciation of the formulation of the paint liquid as to be able to select the durable paint will stand out as simple and not as complex.

Devices:

- I. Evaluation of paint formulas (form)
- II. Evaluation of paint formulas (liquid)
- III. Testing

Notes:

SUGGESTED LESSON PLAN**UNIT IV**

The ability to select a high quality paint which will provide long, low-cost service.

Sub-ability 3 (*Evaluation of the Pigments*).

Factual Material:

1. Heavy metallic pigments are important paint pigments.
2. High quality paints are quite generally heavy paints.
3. The paint pigment has many functions.
4. There are distinct differences between good paint pigments and extenders or fillers.
5. The content of a paint can be readily determined in only one way—by investigation of the formula.
6. Quality paints have a small liquid-pigment ratio (by weight).
7. An "active" paint pigment is best understood by studying the action of white lead in linseed oil.

Objectives:

1. To lead the student to recognize that paint pigments vary greatly in content and therefore in quality.
2. To encourage the student to rely upon an evaluation of the formula in paint selection.
3. To help the student to gain such an understanding and appreciation of the formulation of the paint pigment that the durable paint will stand out as simple and not as complex.

Devices:

- I. Evaluation of paint formulas (pigments).
(Place or rank a number in the order of their quality with reasons such as is done in livestock or grain judging.)
- II. Formulation of paint formulas (pigments).
- III. Testing.

Notes:

II

SUGGESTED LESSON PLAN (Problem Series)

UNIT IV

The ability to select a high quality paint which will provide long, low-cost service.

Sub-ability 1 (*The ability to recognize that paint service varies greatly*).

Inductive Problems:

1. What should paint service provide?
2. What kind of wear should good exterior paint withstand?
3. Should the painting of buildings, machinery and other outdoor equipment yield profitable returns?
4. What life should a paint have to make it a profitable investment?
5. What profits might be reasonably expected from painting?
6. What have been your personal observations regarding the lasting qualities of exterior paints in your community?
7. How should a durable paint appear after two years? Five years? Ten years?
8. How long have buildings gone unpainted in your community?
9. How does paint appear when it begins to fail?

Judgment Problems:

1. Why do the paint coatings on some buildings appear so much better after many years than do those on other buildings after only two or three years?
2. A customer in the paint store was purchasing a red barn paint and asked the clerk about the guarantee on the paint. He told the clerk that the paint he bought in that store a few years ago did not wear as well, nor last as long, on the south side of the barn as on the north side, and that he wanted a paint which could be guaranteed to do equally well on all sides of the building. Was that a reasonable request? Why?
3. The above prospective customer said that unless the paint could be expected to last long enough so that a profit

could be realized he was not interested in investing in paint. What would you say about his sense of values?

4. If you were obliged to choose between a paint which usually gives signs of failure after four years and one which has been proved to be in good condition after seven years with the latter costing just twice as much as the former, which would you choose? Give your reasons.
5. If you are comparing two paints on the basis of their appearance after five years and you find the first checking slightly and small flakes are forming which disappear as the paint gradually chalks, while the second is cracking and scaling as illustrated in Fig. 46, page 36, "Selecting and Applying Paints," which paint would you prefer? Why?

Creative Problems:

1. Make a survey of ten houses in your community noticing the following:
 - (a) Kind of structure: wood, brick, stucco.
 - (b) Color of body, trim, roof.
 - (c) When last painted, kind of paint, number of coats.
 - (d) Condition of surface.
 - (e) How does the paint condition compare on the different exposures (north, east, south, west)?
 - (f) What type of paint errors are in evidence on the basis of errors described on pages 34 to 39 inclusive in "Selecting and Applying Paints"?
 - (g) Write a brief report value of the paint service each building is being provided considering the exposure, age of the paint and its present condition. Which seems to be giving evidence of greatest value and which least? Why?
2. On the basis of your findings from the above survey write an appraisal for a consideration of quality in selecting paints for outside uses.
3. List in a table form the advantages of high-grade paints and the disadvantages of low-grade paints.

SUGGESTED LESSON PLAN (Problem Series)

UNIT IV

The ability to select a high quality paint which will provide long, low-cost service.

Sub-ability 2 (The ability to evaluate the paint liquid).

Inductive Problems:

1. Should a high grade paint contain volatile liquids?
2. Is water one of the common volatiles?
3. What becomes of the volatiles as the paint dries?
4. What amount of water is desirable in an outside paint?
5. How important is linseed oil in exterior paints? What qualities does it possess?
6. Should a painter add raw soybean oil to a paint? Can soybean oil ever constitute as much as one-half of the paint liquid?
7. Should a thinner ever be added to paints for exterior use? What liquids are often used as thinners?
8. When should a drier be used, if ever?
9. The inclusion of what liquid is most fraudulent?
10. How can an inferior paint be low-priced?
11. Should the paint formula be investigated before buying?

Judgment Problems:

1. Evaluate five exterior paint formulas (liquid) placing them in the order of desirability, and state reasons for such ranking. How many of them would you say are acceptable? Which should be used under no conditions? Why?

Creative Problems:

1. List all statements given in the circular about water in an exterior paint. Underline the one which appeals to you as the most significant.
2. Make a list of liquids used in paints (good or inferior) indicating which should always be present, which should be used under certain conditions, and which should never be tolerated in any outside paint.
3. Make a survey of exterior paints in at least three paint stores and copy the formulas of those which include other liquids than those listed under (2) above. Indicate in which category they should be placed.
4. Formulate a high quality paint liquid for a new wood surface building and one to be repainted.

SUGGESTED LESSON PLAN (Problem Series)

UNIT IV

The ability to select a high quality paint which will provide long, low-cost service.

Sub-ability 3 (The ability to evaluate the paint pigments).

Inductive Problems:

1. What are the functions of the pigments in an exterior paint?
2. What is your concept of an "active" pigment?
3. What are the differences between paint pigments and extenders?
4. How can an inferior paint be "low-priced" so far as the pigments are concerned?
5. How does the weight of most good paint pigments compare with that of the fillers or extenders?
6. How can the composition of a paint be determined?
7. How important is the paint formula?
8. What should be the ratio of the liquid to the pigment by weight in a durable paint?
9. What is "Type 'L' paint"?
10. What place does red lead have in painting? Blue lead? Metallic zinc paint?

Judgment Problems:

1. Evaluate five exterior paint formulas for the same color (pigment) placing them in the order of desirability and state reasons for each ranking. How many of them would you say are acceptable? Which should be used under no conditions? Why?
2. Can some paint extenders be used as fillers in both red and white paints? Why?

Creative Problems:

1. Make a list of paint pigments found in good paints. Place in order of their importance.
2. Formulate a high quality red barn paint. White house paint. A gray paint for either house or other buildings. A metal work paint.
3. Write a one-hundred word appeal to a paint customer urging him to rely upon the formula in selecting his paint.
4. List the outstanding characteristics of a high grade paint.