



Republic of the Philippines
Department of Education
National Capital Region
Schools Division Office – Muntinlupa City

SPECIAL PROGRAM IN TECHNICAL VOCATIONAL EDUCATION (SPTVE)
TECHNICAL DRAFTING 9
QUARTER 3- WEEK 4

I. Topic: Electrical Diagram and Symbol

II. Objectives:

At the end of this module, the learner should be able to:

1. identify the type of light source in electrical planning;
2. enumerate the kinds of incandescent and electric discharge lamps; and
3. demonstrate knowledge in light measurement.

III. Brief Introduction

Lighting

Planning for sufficient lighting involves the light, eye, and object. Whether planning lighting for a residence or a large commercial building, the same design factors must be considered. One must consider how much light is needed, what type has the best quality and how should the light be distributed.

Types of Light Source

1. **Incandescent lamps** are comprised basically of a sealed glass containing a filament connected at its ends to the contact area in the base, thereby completing an electric circuit. They provide a small, concentrated glow of light.

Kinds of Incandescent Lamps

- *Inside frosted bulbs* are used to disperse light evenly.
 - *White bulbs* are used for soft light
 - *Silver-bowl bulbs* are used to direct light upward
 - *Outdoor projector bulb* is used as spotlight or floodlight
 - *Colored bulbs* are used for decorative effects
2. **Electric discharge lamps** are lighting devices consisting of a transparent container within which gas is energized by an applied voltage and thereby made to glow.

Kinds of Electric Discharge Lamps

- *Fluorescent* is a gas-discharge lamp that uses electricity to excite mercury vapor to produce short-wave ultraviolet light that is more evenly distributed than an incandescent lamp.
- *Neon – vapor lamps* are used in street and windows signs
- *Mercury - vapor lamps* are the cheapest among the high-intensity discharge (HID) lamps used as residential light





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- *High/Low-Pressure Sodium vapor lamps* are used outdoors or on street lamps and the most economical in power consumption.

Light Measurements

Light is measured in traditional units called foot-candles, A foot-candle is the amount of light a candle throws on an object 1' away. The standard unit of illumination is lux,(lx) in the metric system. One lux is equal to 0.093 footcandles. To convert footcandles to lux, multiply by 10.764-foot candles.

Accepted light levels for various living activities

10-20 footcandles (108 to 215 lx): casual visual tasks, card playing, conversation, television, listening to music, etc.

20-30 footcandles (215 to 320 lx): easy reading, sewing, knitting, house cleaning, etc.

30-50 footcandles (320 to 540 lx): reading newspapers, doing kitchen and laundry work, typing

50-70 footcandles (540 to 750 lx): prolonged reading, machine sewing, hobbies, homework, etc.

70-200 footcandles (750 to 2150 lx): prolonged detailed tasks such as fine sewing, reading the fine print, drafting, etc.

IV. Activities:

Activity 1. Directions: Identify the answer to the following statement. Write your answer on a separate sheet of paper.

1. It is a gas-discharge lamp that uses electricity to excite mercury vapor to produce short-wave ultraviolet light that is more evenly distributed than an incandescent lamp.
2. It is comprised basically of a sealed glass containing a filament connected at its ends to the contact area in the base, thereby completing an electric circuit. They provide a small, concentrated glow of light.
3. The amount of light a candle throws on an object 1' away.
4. It is the standard unit of illumination.
5. It is used outdoors or on streetlamps and the most economical in power consumption.

Activity 2. Directions: Enumerate the following. Write your answer on a separate sheet of paper.

Types of Light Source

1. _____
2. _____





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Kinds of Incandescent lamps

1. _____
2. _____
3. _____
4. _____
5. _____

Kinds of Electric Discharge Lamps

1. _____
2. _____
3. _____
4. _____

Activity 3. Directions: Choose from the selections to match the following activities to their corresponding accepted light levels. Write your answer on a separate sheet of paper.

Light levels according to footcandles: 10-20, 20-30, 30-50, 50-70, 70-200

- | | |
|---|-------|
| 1. Prolonged details task such as fine sewing | _____ |
| 2. Prolonged reading, hobbies | _____ |
| 3. Reading newspapers, | _____ |
| 4. Easy reading, sewing, knitting | _____ |
| 5. Casual visual tasks, listening to music | _____ |
| 6. Reading fine print | _____ |
| 7. Machine sewing | _____ |
| 8. Doing kitchen and laundry work | _____ |
| 9. House cleaning | _____ |
| 10. Card playing | _____ |
| 11. Drafting activities | _____ |
| 12. Conversation | _____ |
| 13. Doing homework | _____ |
| 14. Watching television | _____ |
| 15. Typing task | _____ |

IV. Assessment:

Directions: Write your BEST answer on a separate sheet of paper.

- | | |
|---------------------------------|---------------------------|
| 1. Used to direct light upward. | |
| A. White bulbs | C. Outdoor projector bulb |
| B. Silver bowl bulbs | D. Neon lamp |
| 2. It is used for soft light. | |
| A. White bulbs | C. Outdoor projector bulb |
| B. Silver bowl bulbs | D. Neon lamp |





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3. It is used as spotlight or floodlight.
A. White bulbs
B. Silver bowl bulbs
C. Outdoor projector bulb
D. Neon lamp
4. It is used in street and windows signs.
A. White bulbs
B. Silver bowl bulbs
C. Outdoor projector bulb
D. Neon lamp
5. It is the cheapest among the high intensity discharge used as residential light.
A. Fluorescent lamps
B. High/Low pressure Sodium vapor lamps
C. Mercury lamps
D. Neon lamps

VI. Reflection: Give your thoughts on the question below.

1. How important to determine the lightning level of a particular room? _____

2. How important to a future engineer to determine the type of light source he will use?

References:

Textbook: Drafting Electrical and Electronic Layout and Details, Authors: Mario S. Gregorio, Alexander M. Latoga, Mirasol F. Dasig, Ariel F. Maglalang, Conrado C. Casulla, Rolando V. Inay

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