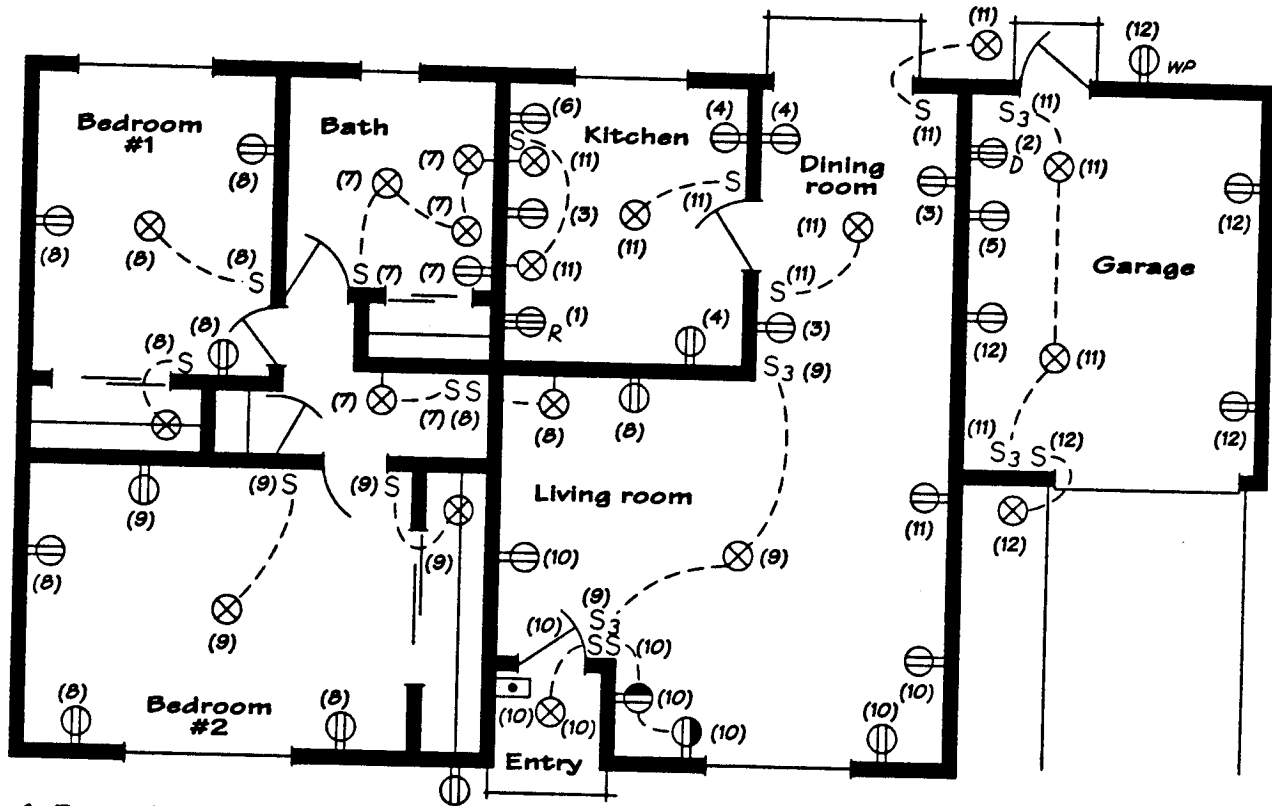


## CIRCUIT MAPPING












Using numbers and electrical symbols, you can make up a good working drawing of your electrical system. Such a drawing or map can save you much time, whether you plan to wire a new home, alter existing wiring, or trou-

bleshoot a problem. The following is a circuit map of a typical two-bedroom house. Note that the dashed lines indicate which switch controls which fixture; they do not show wire routes.



1. Range (240-volt circuit)
2. Dryer (240-volt circuit)
3. Kitchen and dining room  
20 amp
4. Kitchen and dining room  
20 amp
5. Washer  
20 amp
6. Dishwasher  
20 amp
7. Bath and hall  
15 amp
8. Bedroom #1  
15 amp
9. Bedroom #2  
15 amp
10. Living room  
15 amp
11. Living room  
15 amp
12. Garage  
20 amp

### ELECTRICAL SYMBOLS

-  Light fixture
-  Duplex receptacle
-  Duplex receptacle, half controlled by switch
-  Single-pole switch
-  Three-way switch
-  Range outlet
-  Dryer outlet
-  Special outlet
-  Doorbell
-  Weatherproof receptacle
-  Switch wiring

# COURSE ARCH-DRAWING I

## TOPIC: ELECTRIC PLAN

(CURRICULUM TOPIC)

(Pencil)

2014 Pencil  
Cuss Entry

### VOCABULARY LIST:

## NEC Residential Requirements

### NOTES & LESSON MATERIALS:

? WHAT TYPE OF DEVICES (ELECTRONIC) ARE NEEDED IN A HOME?

OUTLETS / LIGHTS / SWITCHES / SD'S

3 TYPES OF CIRCUITS - GENERAL  
Appliance  
Special

### LIGHTS -

1. BASEMENT
2. STAIRWAYS - 3WAY (TOP TO BOTTOM)
3. ENTRANCE LIGHTS (PRINCIPLE ENTRY)
4. ROOM LIGHTS - LIGHT OR SWITCHABLE OUTLET
5. GARAGE
6. OPTIONAL CLOSET LIGHTS - (PULL CHAINS IN CLOSETS LARGER THAN 18" DEEP.)

### SWITCHES -

1. 48" ABOVE FLOOR
2. WITHIN 6' OF DOOR OR OPENING

### DISTRIBUTION PANEL -

1. WITHIN 4' OF ENTRANCE CABLE ENTERING HOUSE.
2. ALL CIRCUITS USE AN SD (FUSE / CB / GFCI)

TOPIC: \_\_\_\_\_

(CURRICULUM TOPIC)

DEPT. NAME  
CLASS ENTRY

VOOCABULARY LIST:

## NEC REQUIREMENTS CON'T.

NOTES & LESSON MATERIALS:

\* GENERAL CIRCUITS / APPLIANCE / SPECIAL PURPOSE  
OUTLETS - ALL "LIVING AREAS"

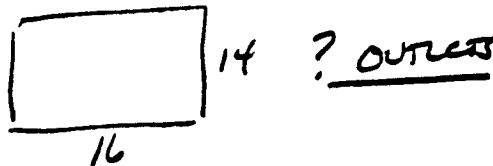
ROOMS - LIVING, KIT, DINING, FAMILY, BED,  
BATH, RECREATION, ETC.

"NOT" IN - UTILITY, GARAGE, ATTIC, BASEMENTS, ETC.

1. MINIMUM 12" ABOVE FLOOR  
(KITCHEN ABOVE CABINET COUNTERTOPS)  
(BATH NEXT TO SINK)

\* 2. ONE FOR EVERY 50 SQ. FT OR PORTION.

Room size 16 x 14



$$\begin{array}{r} 16 \\ 14 \\ \hline 64 \end{array} \quad 50 \overline{)224}$$

$$\begin{array}{r} 16 \\ \hline 224 \end{array} \quad \begin{array}{l} 4.4 \\ \hline 5 \text{ required} \end{array}$$

How many in A:

Room:  $8 \times 12 = 96 \div 50 = 1.92 = \textcircled{2}$

$14 \times 12'-6" = 175 \div 50 = 3.5 = \textcircled{4}$

$16'-6" \times 13'-10" = 228 \div 50 = 4.56 = \textcircled{5}$

$23'-4" \times 10'-11" = 254 \div 50 = 5.09 = \textcircled{6}$

$22'-5" \times 11'-6" = 257 \div 50 = 5.16 = \textcircled{6}$

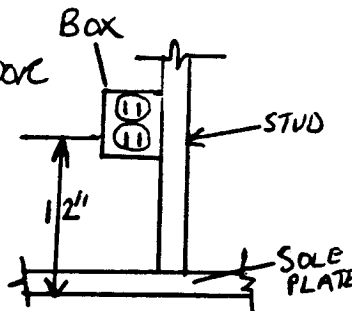
VOCABULARY LIST:

Nec Requirements CONTINUED

NOTES & LESSON MATERIALS:

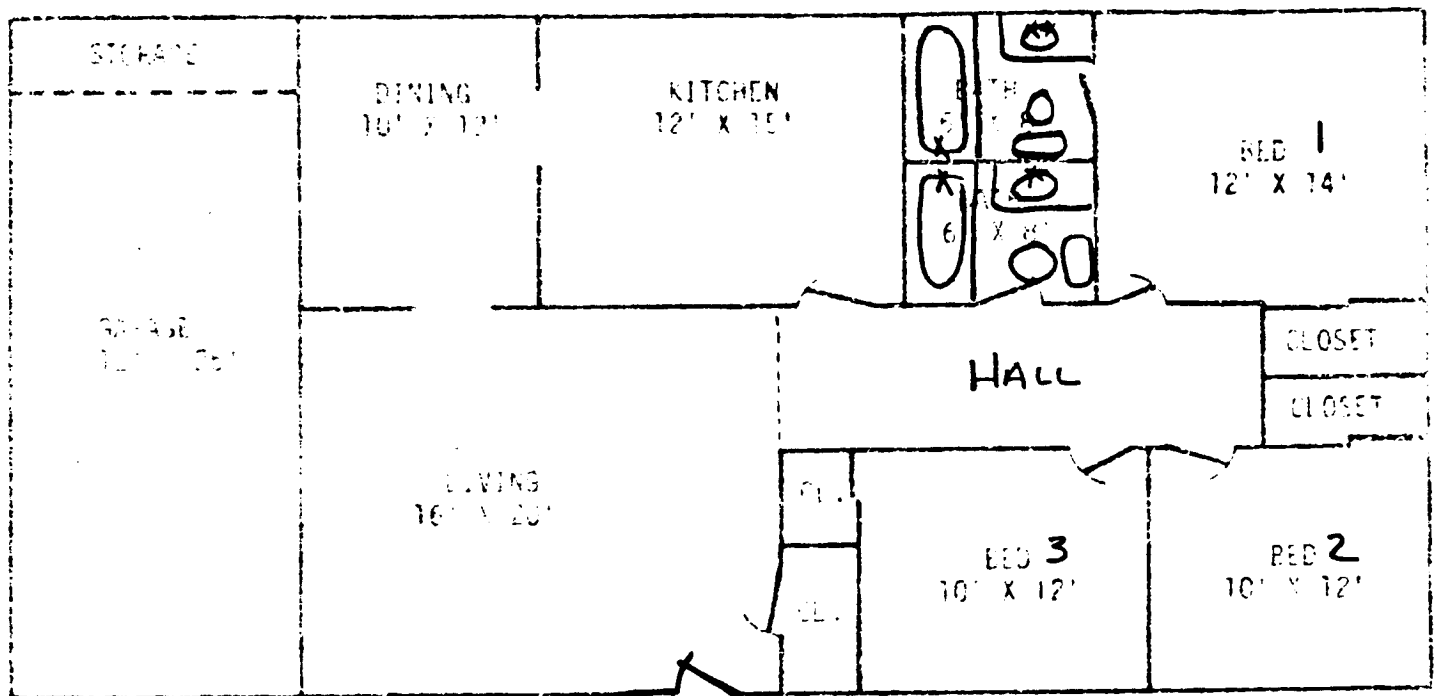
OUTLETS CONT.

- \*3. WITHIN 6' OF DOOR OR ROOM ENTRANCE.
- \*4. 12' MAXIMUM BETWEEN OUTLETS.
- \*5. KITCHEN MINIMUM 2 CIRCUITS WITH 2 OUTLETS EACH. (20 AMP RATED)
- \*6. DINING ROOM MINIMUM 1 CIRCUIT WITH 2 OUTLETS EACH. (20 AMP RATED)
- \*7. KITCHEN LIGHTS SEPARATE FROM OUTLETS ON CIRCUITS.
- \*8. BATHROOMS - GFCI'S
- \*9. OUTSIDE - GFCI'S (GARAGE)
- \*10. 12" OFF FLOOR



OR OLD CONST  
SAME HEIGHT AS OLD  
BOXES/OUTLETS

# House PLAN

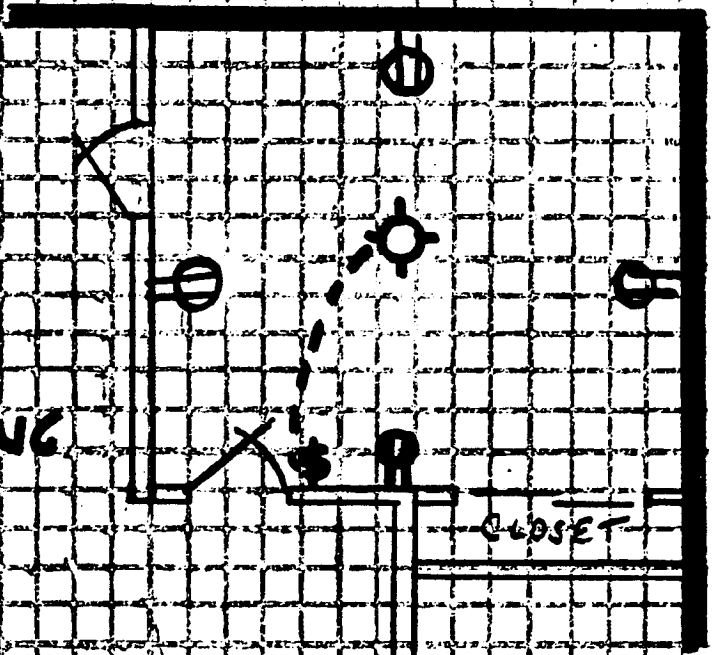


## Procedure:

1. DRAW ROOM TO SCALE  $\frac{1}{4}'' = 1'-0''$   
(SEE GRAPH PAPER) WALLS 6" THICK.  
OUTSIDE WALLS SOLID.
2. DRAW, USING SYMBOLS, LIGHTING REQUIREMENT.  
(SEE GRAPH PAPER - SWITCH & CENTERED LIGHT)
3. CALCULATE DUPLEX OUTLET REQUIREMENT
  - a. FIND SQ. FT AREA ( $12 \times 14 = 168$ )
  - b.  $\div$  BY 50 ( $168 \div 50 = 3.3$ ) 1 OUTLET FOR EVERY 50  $\square'$  OR PORTION THEREOF. 3.3  $\rightarrow$  ROUND UP TO ④
  - c. START WITHIN 6'-0" OF DOOR EDGE, PLACE OUTLET SYMBOL AND 3 MORE NO MORE THAN 12'-0" APART.
4. MOVE ON TO NEXT ROOM.

# SAMPLE BED #1

1. SCALE DRAWING



2. LIGHTING REQUIREMENT

CENTER LIGHT OUTLET.

SINGLE POLE SWITCH CONTROL.

NO CLOSET LIGHT NEEDED.

3. DUPLEX REQUIREMENT:

$$\begin{array}{r}
 \text{AREA} \quad 12 \\
 \times 14 \\
 \hline
 48 \\
 \underline{12} \\
 \hline
 \end{array}$$

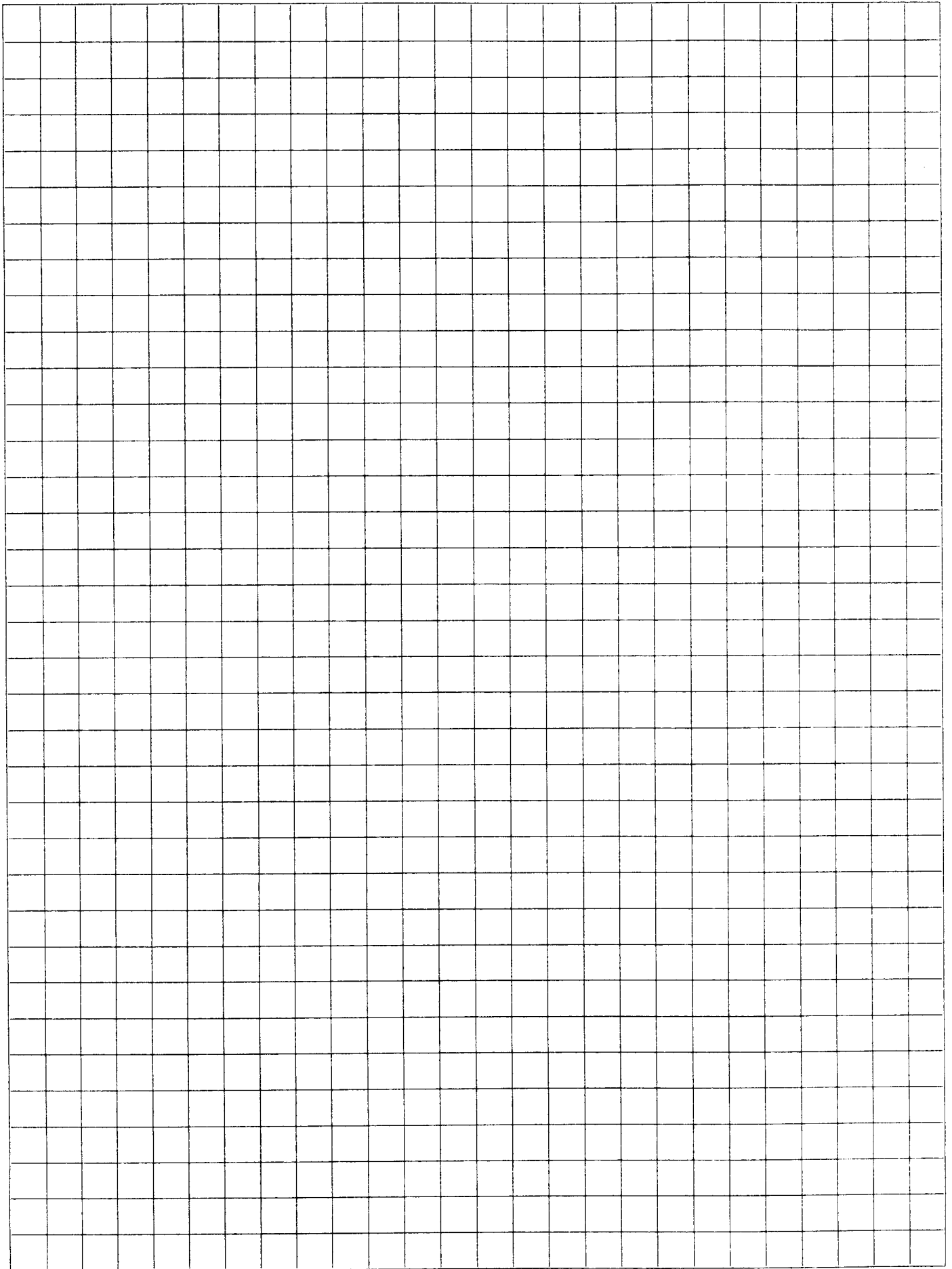
TOTAL 168 SQ. FT.

(∴ 60 SQ FT PER OUTLET)

$$\begin{array}{r}
 3.3 \rightarrow 4 \\
 \hline
 50 \overline{) 1680} \\
 \underline{150} \\
 180 \\
 \underline{150} \\
 30
 \end{array}$$

Required

4. CHECK TO SEE THAT MAXIMUM OF 12 FEET BETWEEN OUTLETS IS NOT EXCEEDED.



Name \_\_\_\_\_

### Electronics Outlet Requirement Worksheet

Calculate how many outlets are needed in the following rooms.

Room square footage divided by 50 = number of outlets needed per room.(always round up).

Example:

$$\text{Room: } 8' \times 10' = 80' / 50 = 1.6 = 2 \text{ outlets}$$

1. 18' x 20'

2. 9' x 24'

3. 15' x 20'

4. 12'-6" x 22'-3"

5. 14' x 30'

6. 13' x 25'

7. 16' 5" x 32'-8"

8. 19'-6 x 28'

9. 24' x 40'

10. 27'-10" x 37'-7"