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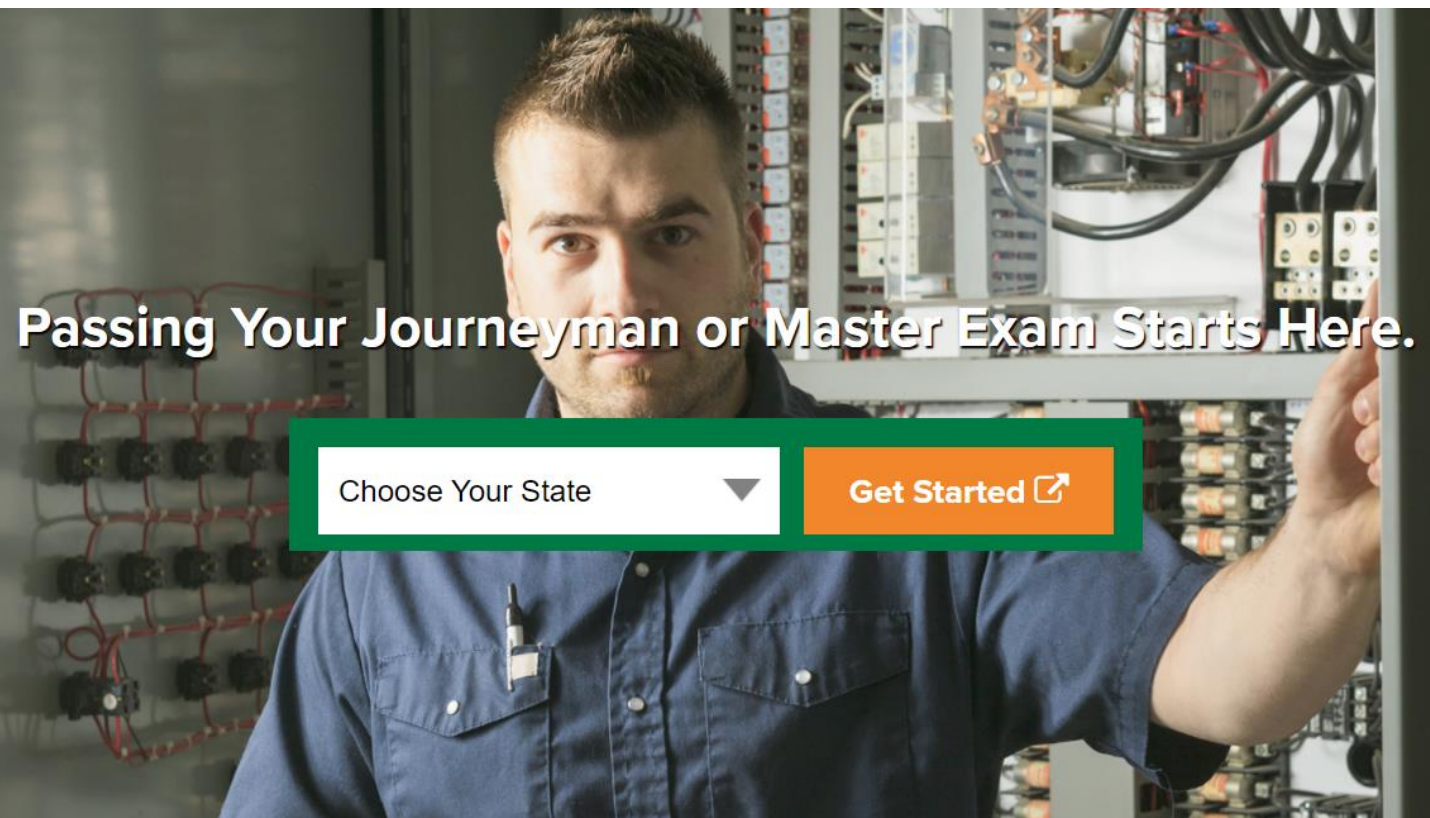
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1(800)443-5233



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Today's Electrical Training Session

Welcome Iowa Electricians!

What Does Iowa Require?

18-Hours of Continuing Education Required

- The Iowa electrician must complete no less than 18 Continuing Education Units (CEUs) in each three-year license cycle.
- No less than 6 of those 18 CEUs must focus on the most recent Iowa electrical code.
- JADE Learning's two-hour VILT sessions satisfy ALL of Iowa's requirements for electrical continuing education.
9 VILT sessions provides you all 18 hours.



2020 NEC Changes

Important Changes from the 2020 NEC

6:00 PM Eastern Time

5 PM in Iowa

5:40 PM – 6:00 PM	Registration / Check In
6:00 PM – 7:00 PM	NEC Introduction and Chapter 2a <i>with poll questions</i>
7:00 PM – 7:10 PM	Break
7:10 PM – 7:55 PM	NEC Chapter 2a (Continued) <i>with poll questions</i>
7:55 PM – 8:00 PM	Questions for the instructor?

Poll Question *Example:*

Polling 1: 3/19 discussion question #1 Edit

Poll 1: Electrical

1. What color is a green grounding screw?

☐ Blue

☐ Red

☐ Green

☐ Black

2020 NEC Changes

Important Changes from the 2020 NEC

Instructor: Jerry Durham

Quick Summary

- Stay attentive to the VILT session, your activity is being monitored.
- Incorrect answers to Poll Questions **do not count against you**, however, participation in each Poll Question is mandatory to receive course credit.
- If you have trouble hearing or need assistance, let us know.
- Make sure you have paid and provided JADE Learning your electrical license number.
- Be sure to sign-in/check-in and confirm your registration information is correct.
- You will be emailed a copy of your certificate within 2 business days.
- You must complete a short survey at the end of class to receive credit from the state. Your instructor will provide the link and answer any questions.

Questions? Concerns?

Call the JADE Learning office at 1-800-443-5233

Iowa



2020 NEC Changes INTRODUCTION & CHAPTER 2a

- 2-Hours Credit

Welcome Iowa



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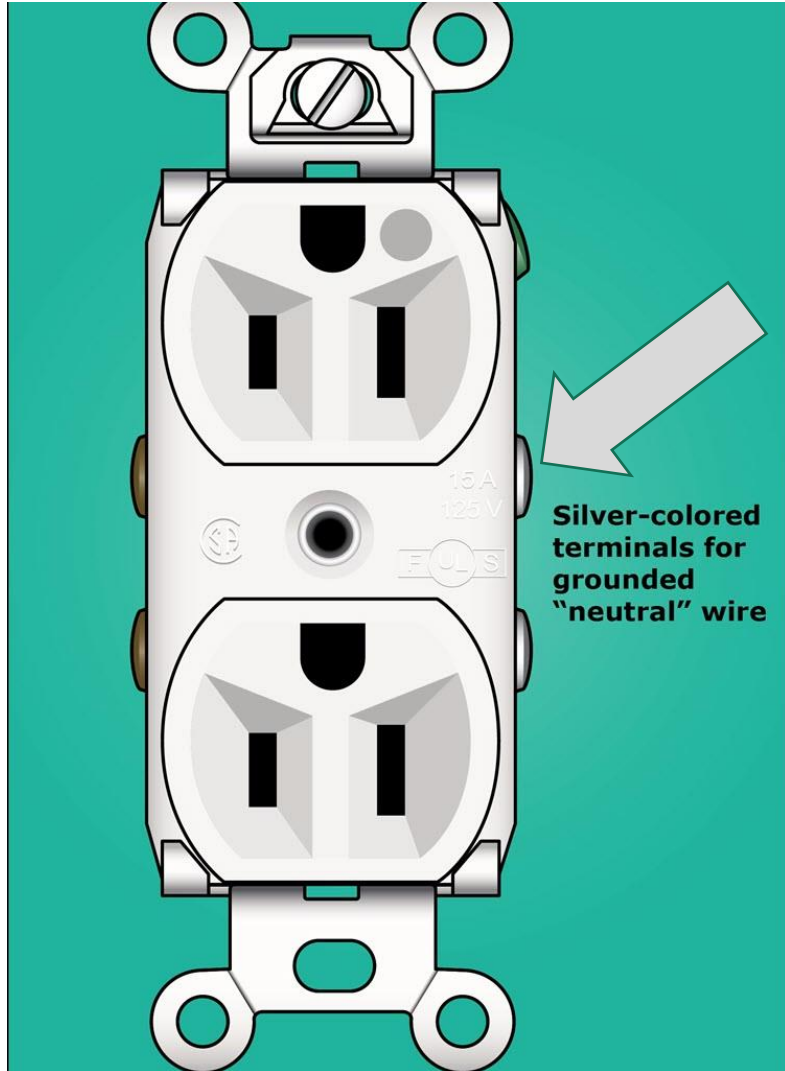




2020 NEC CHANGES

Chapter 2a

200.10(B) Identification of Terminals.



2017 NEC:

The grounded (neutral) terminals must be coated or manufactured of metal that is white or marked by the word “white” or with the letter “W.”

2020 NEC:

The grounded (neutral) terminals must be white or silver or marked by the word “white” or with the letter “W.”

200.10(B) Identification of Terminals.

2017 NEC:

The grounded (neutral) terminals must be coated or manufactured of metal that is white or marked by the word “white” or with

WHY THE CHANGE IN NEC TEXT?

2020 NEC:

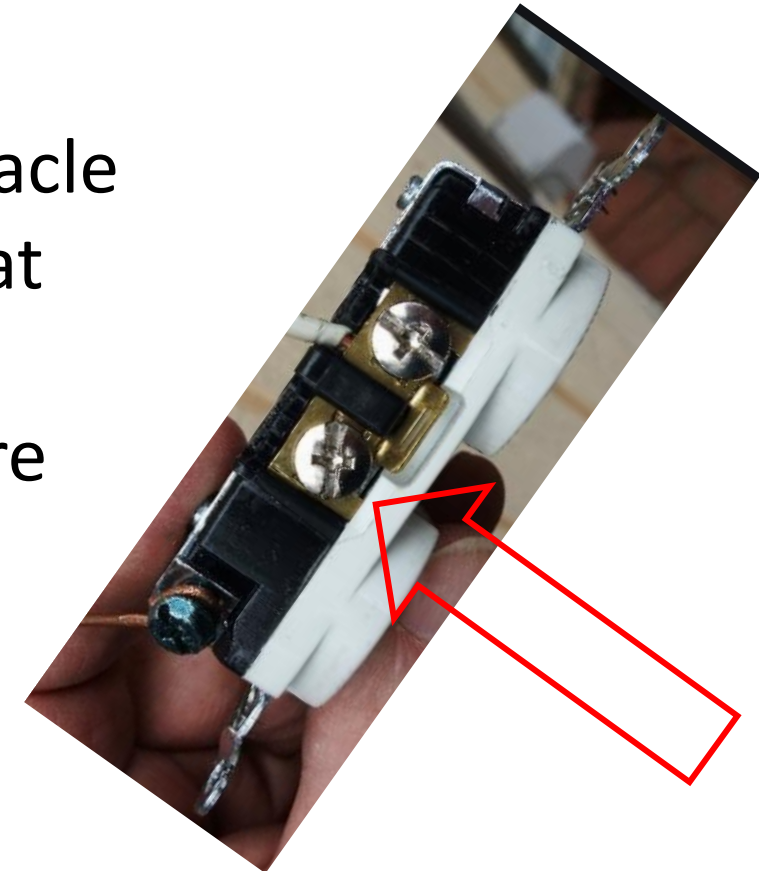
The grounded (neutral) terminals must be coated or manufactured of metal that is white or silver or marked by the word “white” or with the letter “W.”

200.10(B) Identification of Terminals.

WHY THE CHANGE IN NEC TEXT?

A close look at a device such as a receptacle or switch reveals terminals or screws that are rarely if ever white in color. The terminals for the grounded conductor are usually silver in appearance.

THE NEC WAS JUST CATCHING UP!

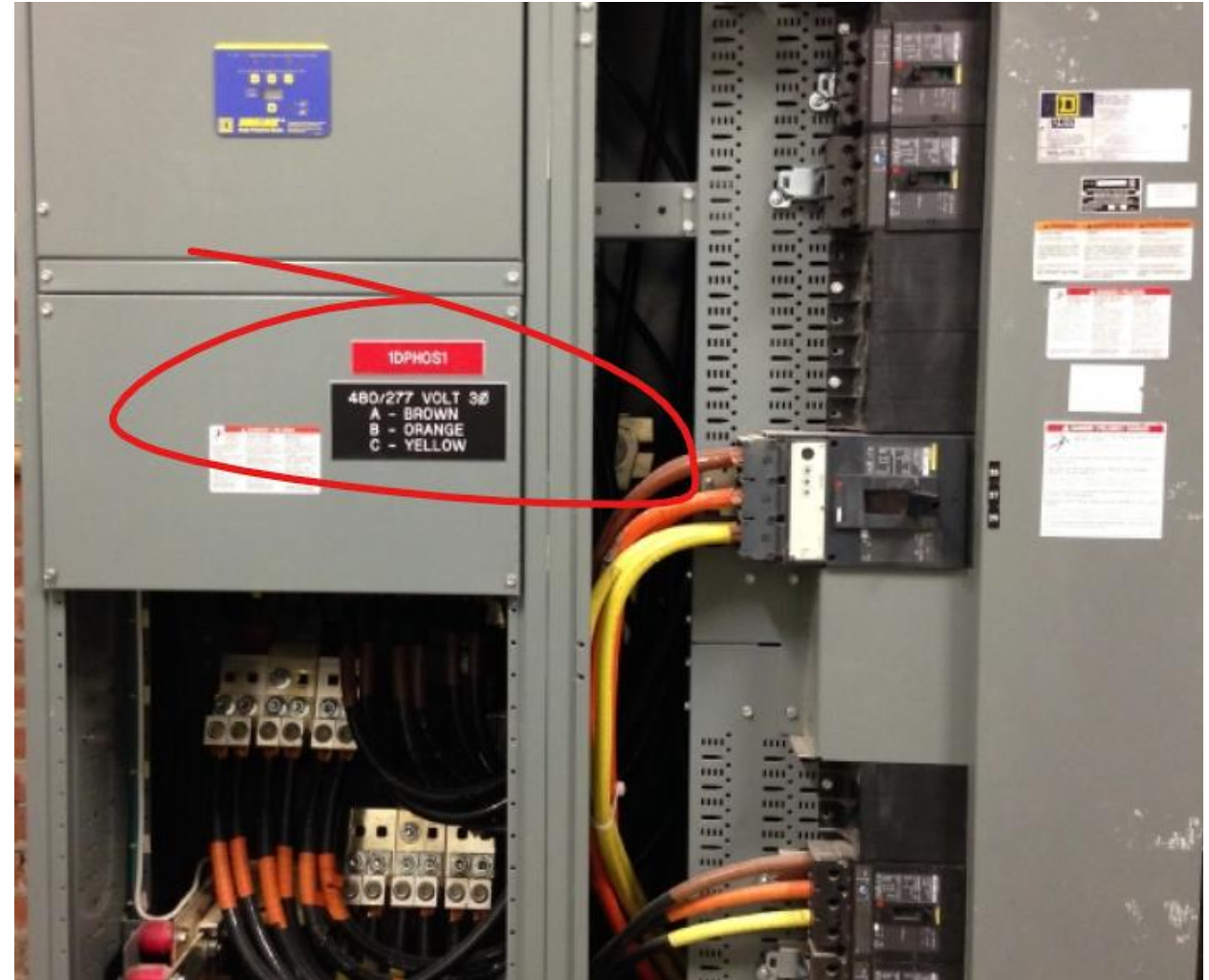


210.5(C)(1) Branch Circuits Supplied from More Than One Nominal Voltage System.

In the 2017 NEC and 2020 NEC:

Where the building's wiring contains branch circuits supplied from more than one voltage system, each ungrounded conductor of each branch circuit must be identified by phase or line.

NOTE: 240-volt is **SINGLE-PHASE** and depending on the jurisdiction's interpretation, both ungrounded conductors may be permitted to remain **BLACK**.



210.5(C)(1) Branch Circuits Supplied from More Than One Nominal Voltage System.

The 2017 Code Language:

210.5(C)(1) Branch Circuits Supplied from More Than One Nominal Voltage System. *Where the premises wiring system has branch circuits supplied from more than one nominal voltage system, each ungrounded conductor of a branch circuit shall be identified by phase or line and system at all termination, connection, and splice points in compliance with 210.5(C)(1)(a) and (b).*

(a) Means of Identification. *The means of identification shall be permitted to be by separate color coding, marking tape, tagging, or other approved means.*

(b) Posting of Identification Means. *The method utilized for conductors originating within each branch-circuit panelboard or similar branch-circuit distribution equipment shall be documented in a manner that is readily available or shall be permanently posted at each branch-circuit panelboard or similar branch-circuit distribution equipment. The label shall be of sufficient durability to withstand the environment involved and shall not be handwritten.*

210.5(C)(1) Branch Circuits Supplied from More Than One Nominal Voltage System.

The 2020 Code Language:

210.5(C)(1) Branch Circuits Supplied from More Than One Nominal Voltage System. *Where the premises wiring system has branch circuits supplied from more than one nominal voltage system, each ungrounded conductor of a branch circuit shall be identified by phase or line and by system voltage class at all termination, connection, and splice points in compliance with 210.5(C)(1)(a) and (b). Different systems within the same premises that have the same system voltage class shall be permitted to use the same identification.*

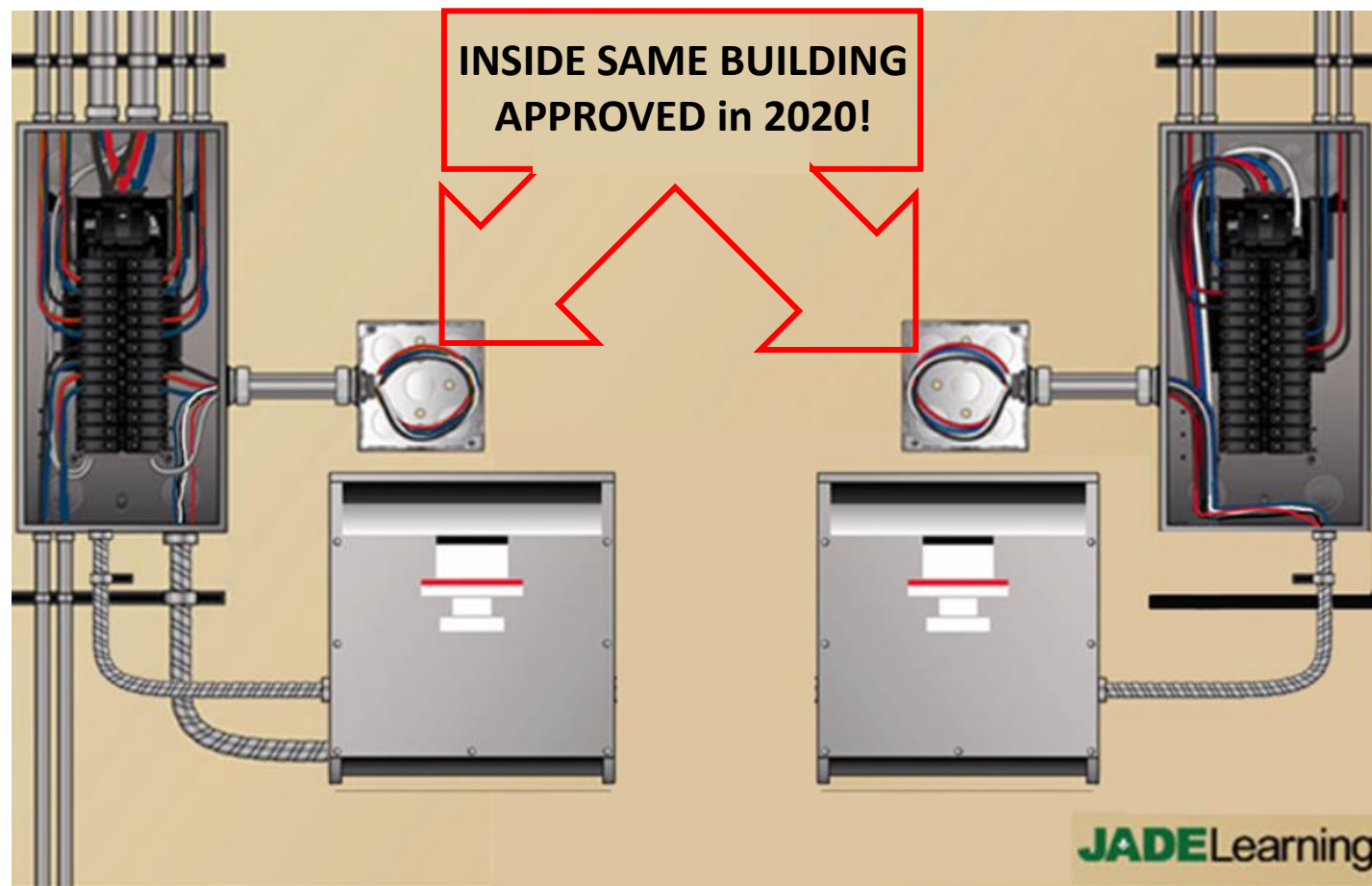
(a) Means of Identification. *The means of identification shall be permitted to be by separate color coding, marking tape, tagging, or other approved means.*

(b) Posting of Identification Means. *The method utilized for conductors originating within each branch-circuit panelboard or similar branch-circuit distribution equipment shall be documented in a manner that is readily available or shall be permanently posted at each branch-circuit panelboard or similar branch-circuit distribution equipment. The label shall be of sufficient durability to withstand the environment involved and shall not be handwritten.*

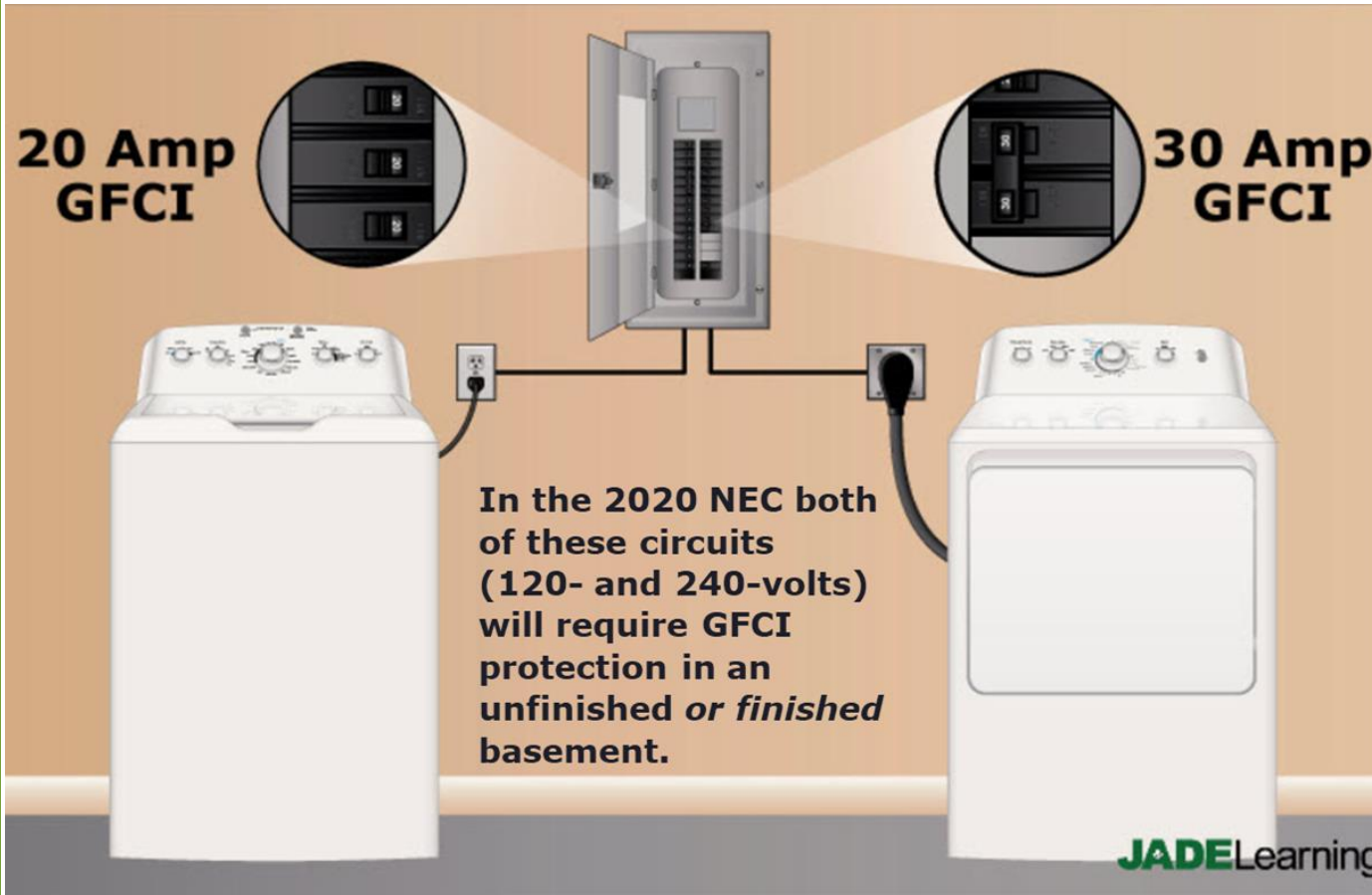
210.5(C)(1) Branch Circuits Supplied from More Than One Nominal Voltage System.

2017 NEC: Different systems in the same building that have the same system voltage class must use different means of identification.

2020 NEC: Different systems in the same building that have the same system voltage class are allowed to use **the same** means of identification.



210.8(A) Branch Circuits. Ground Fault Circuit-Interrupter (GFCI) Protection. Dwelling Units.



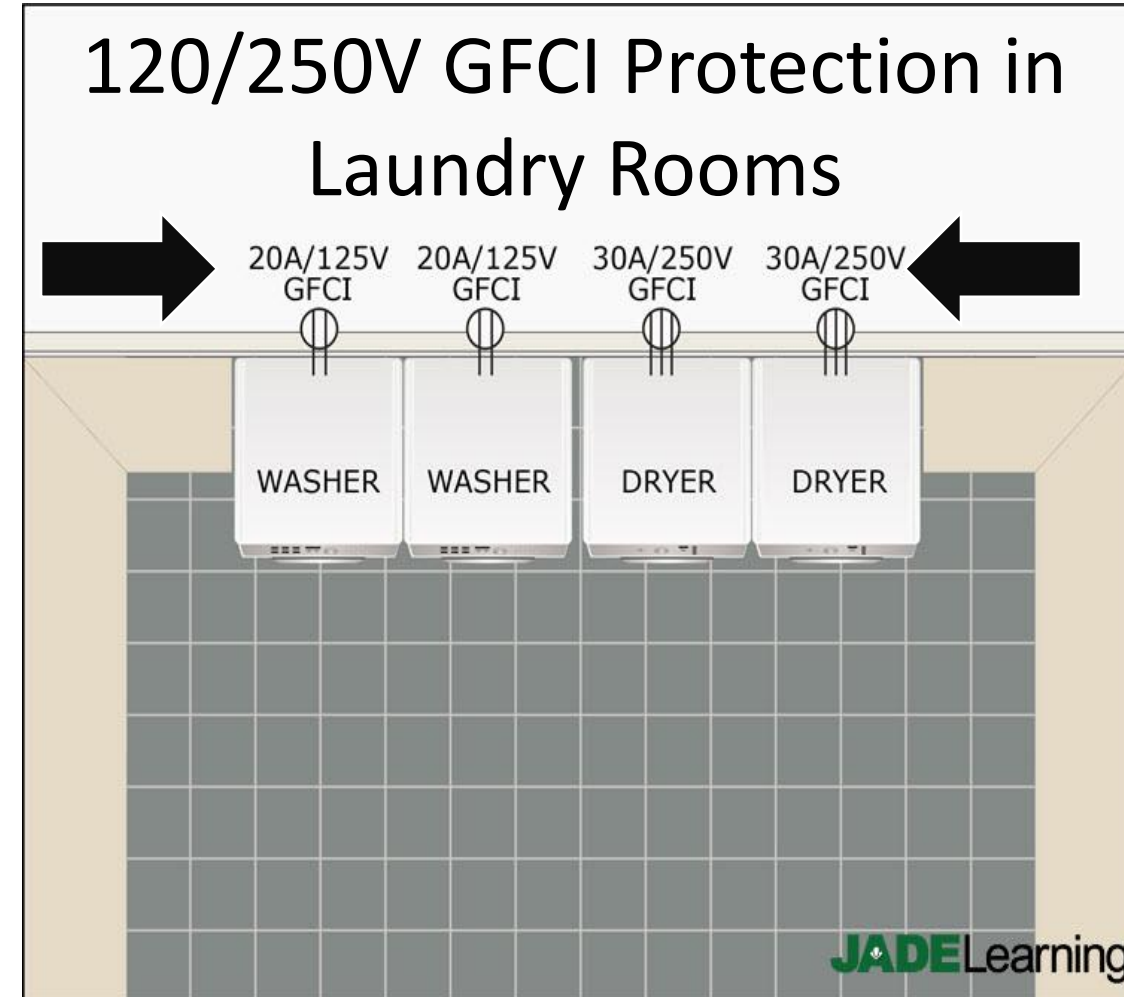
In the 2020 NEC dwelling unit receptacles up to 250-volts (***not until 1-01-2022 for Iowa***) require GFCI protection in ***11 locations*** specified in NEC Section 210.8.

This now includes all areas of a dwelling unit basement!

Indoor damp and wet locations in dwellings must now be GFCI protected too!

210.8(B) GFCI Protection for Personnel. Other Than Dwelling Units.

- In the 2020 NEC all 125-volt and 250-volt receptacles in **laundry rooms** require GFCI protection.
- GFCI protection is required in kitchens or *areas with a sink and permanent provisions for either food preparation or cooking.*
- Indoor damp locations (not just wet locations) need GFCI protection.



210.8(C) Crawl Space Lighting Outlets.

In the 2020 NEC— GFCI protection shall be provided for lighting outlets not exceeding 120 Volts installed in crawl spaces.

Lights in all crawl spaces (not just dwellings) must now be GFCI protected.



Don't forget: All GFCI devices must be readily accessible.

210.8(D) Specific Appliances.



In the 2020 NEC—

- GFCI requirements for dishwashers were moved to Section 422.
- Vending machines must now include GFCI protection in their attachment plug or in their power cord not more than 12 inches from the attachment plug.

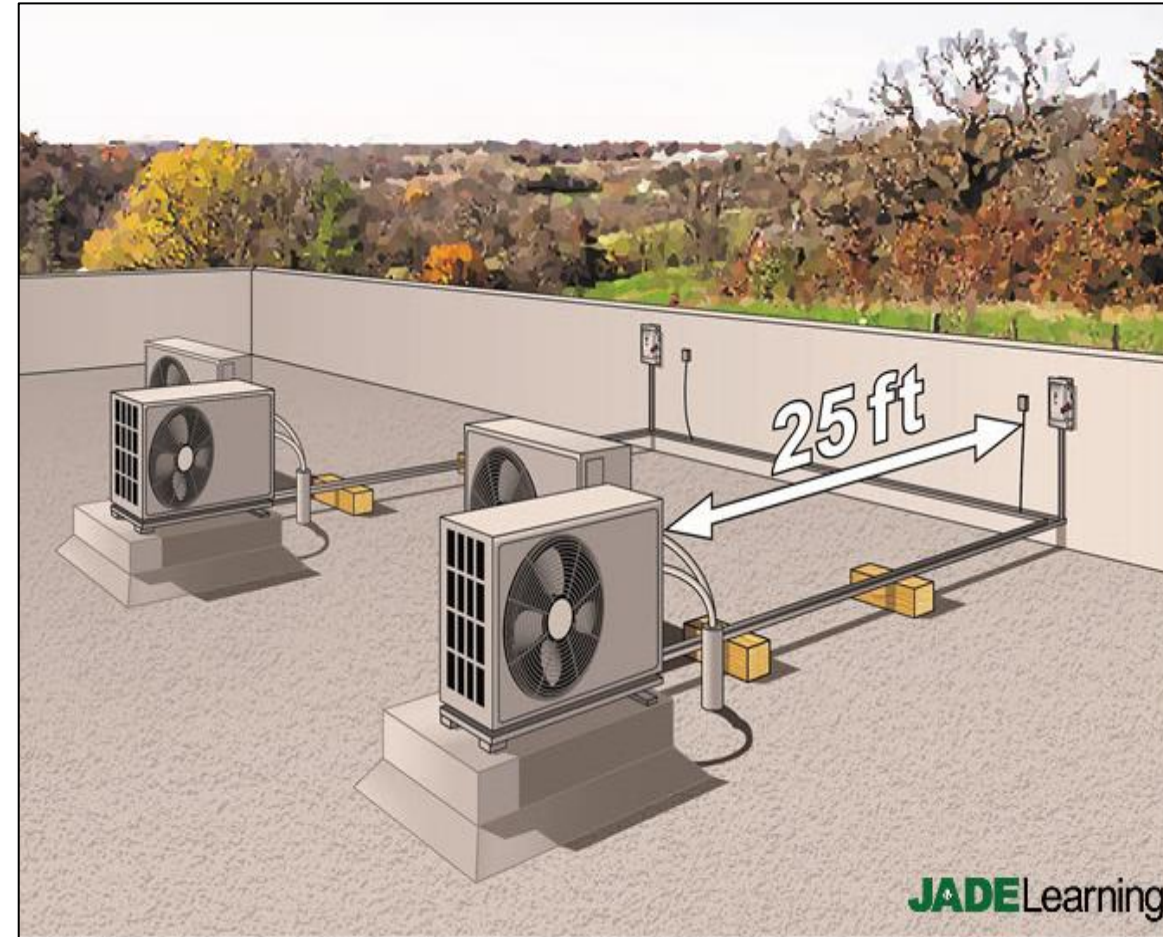
210.8(E) Equipment Requiring Servicing.

In the 2020 NEC— GFCI protection is required for 125-volt, single-phase receptacles installed in the following locations.

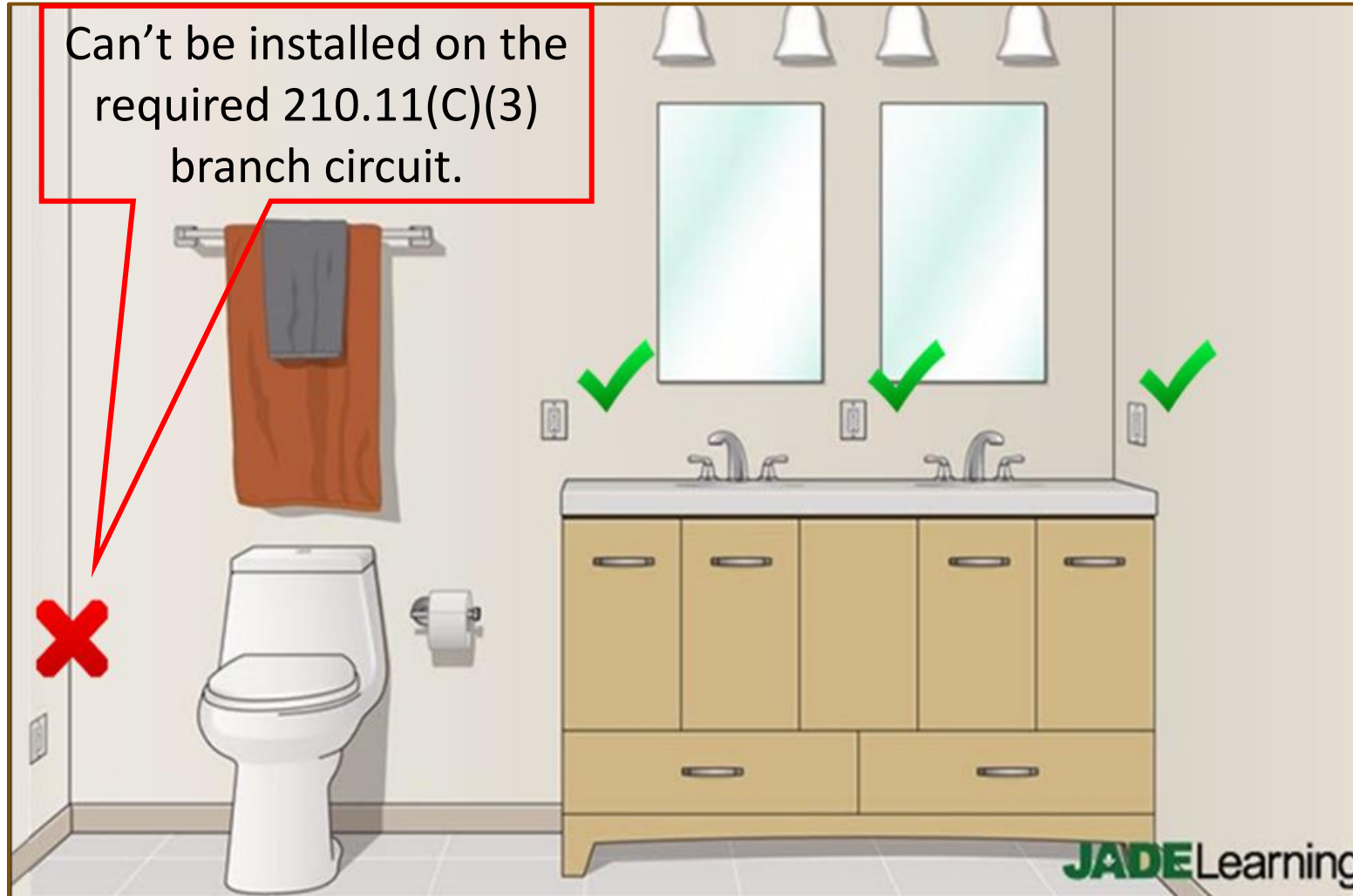
- Within 25 feet of all HVAC and refrigeration equipment addressed in 210.63 (**including in attics!**)

And in *Other than Dwelling Units*:

- In the same room or area as service equipment.
- In indoor dedicated spaces for other types of equipment.



210.11(C)(3) Bathroom Branch Circuits.



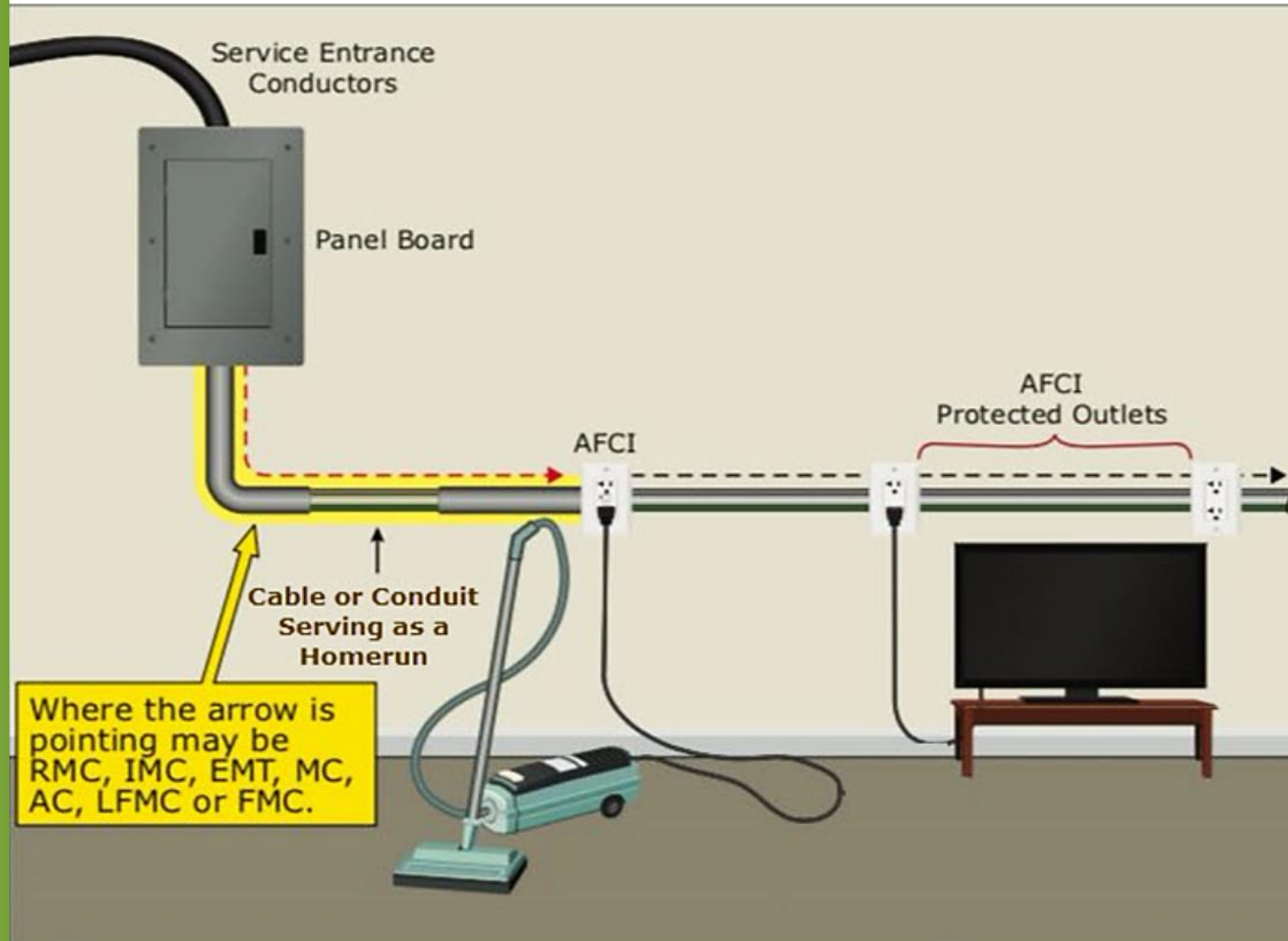
- In the 2020 NEC— The 20-amp branch circuit required for bathrooms is now limited to feeding only countertop receptacles in bathrooms.
- Floor receptacles must be fed from a different branch circuit.

210.11(C)(4) Garage Branch Circuits.

- In the 2020 NEC— The required 20-amp garage branch circuit is permitted to supply only receptacles covered in Section 210.52(G)(1), not all garage receptacles.
- Section 210.52(G)(1) requires one receptacle in each vehicle bay no more than 5 ½ feet above the floor.



210.12(A)(5) AFCI- Dwelling Units (C),(D).



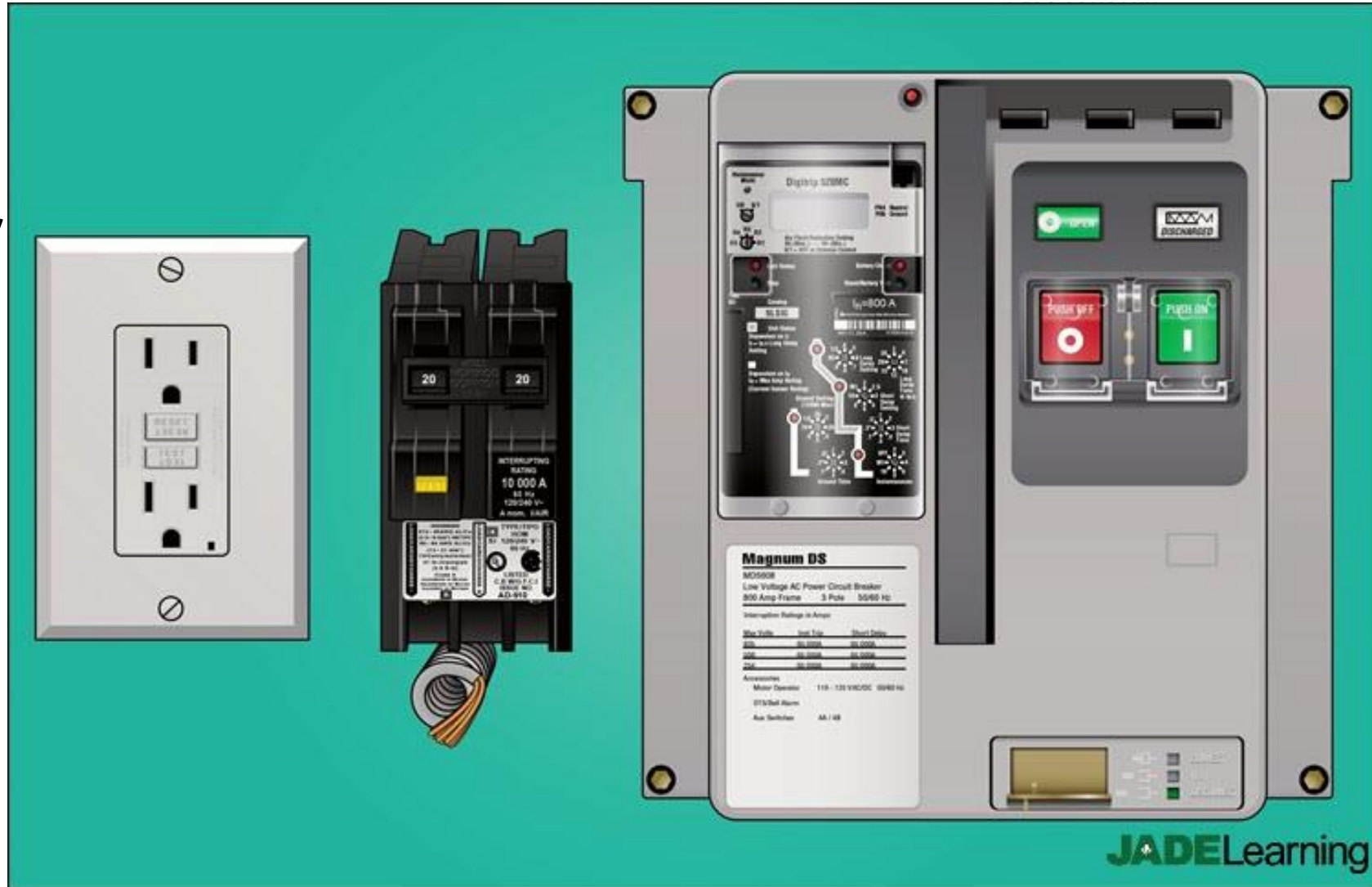
In the 2020 NEC—
When AFCI protection is provided at the first outlet of a branch circuit, a metal raceway is required between the panel and that first outlet.

A metal raceway is NOT required if the AFCI protection is a circuit breaker in the panel.

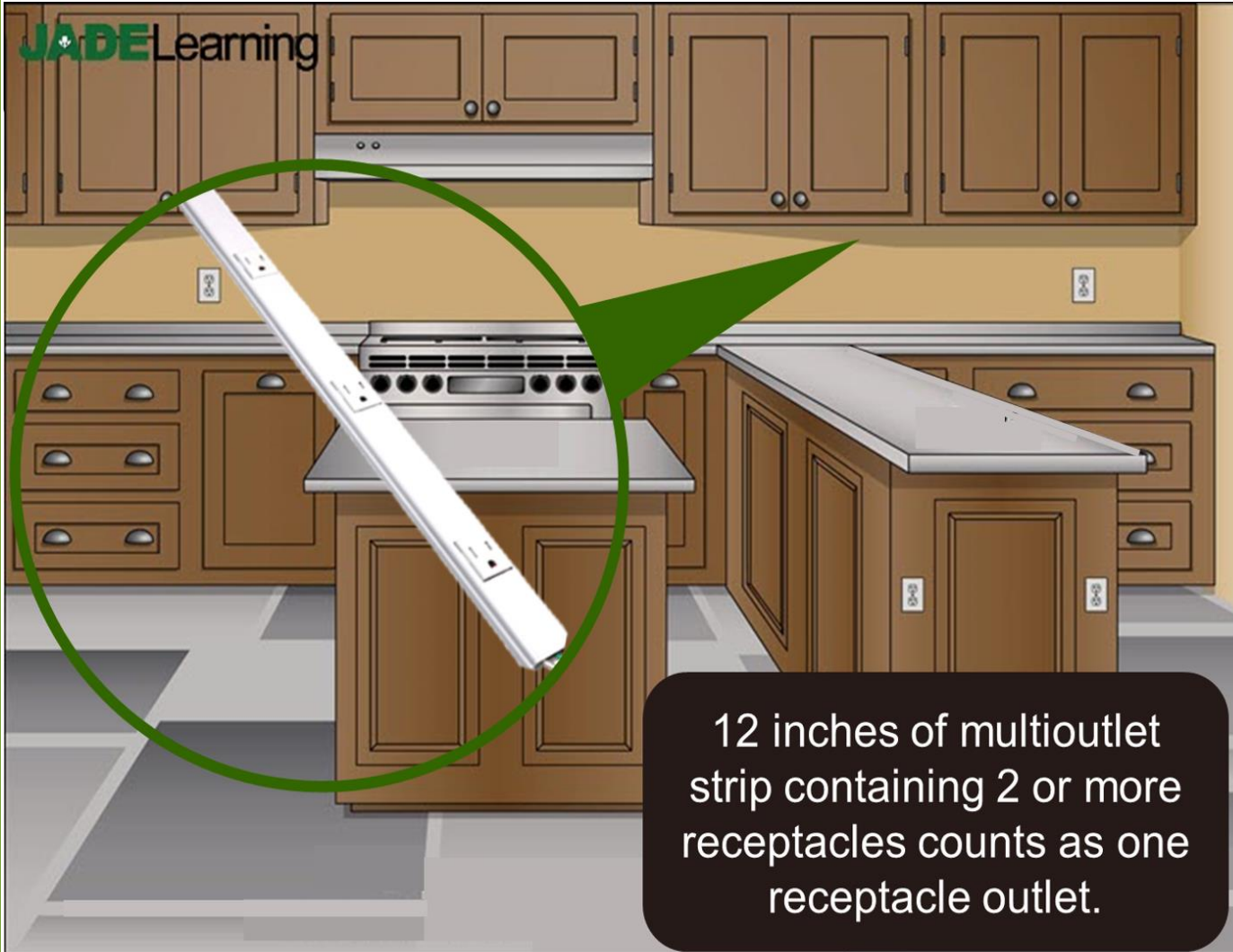
210.15 Reconditioned Equipment.

In the 2020 NEC—
The following
equipment is expressly
prohibited from being
reconditioned:

- GFCIs
- AFCIs
- Ground-Fault
Protection for
Equipment (GFPE)



210.52(C) Countertop and Work Surfaces.



12 inches of multioutlet strip containing 2 or more receptacles counts as one receptacle outlet.

In the 2020 NEC—

- At countertops, each 12-inch length of multioutlet receptacle assembly containing two or more receptacles shall be considered one receptacle outlet.

210.52(C) Countertop and Work Surfaces.

This UL-listed plug strip is NOT a
Multioutlet Receptacle Assembly.

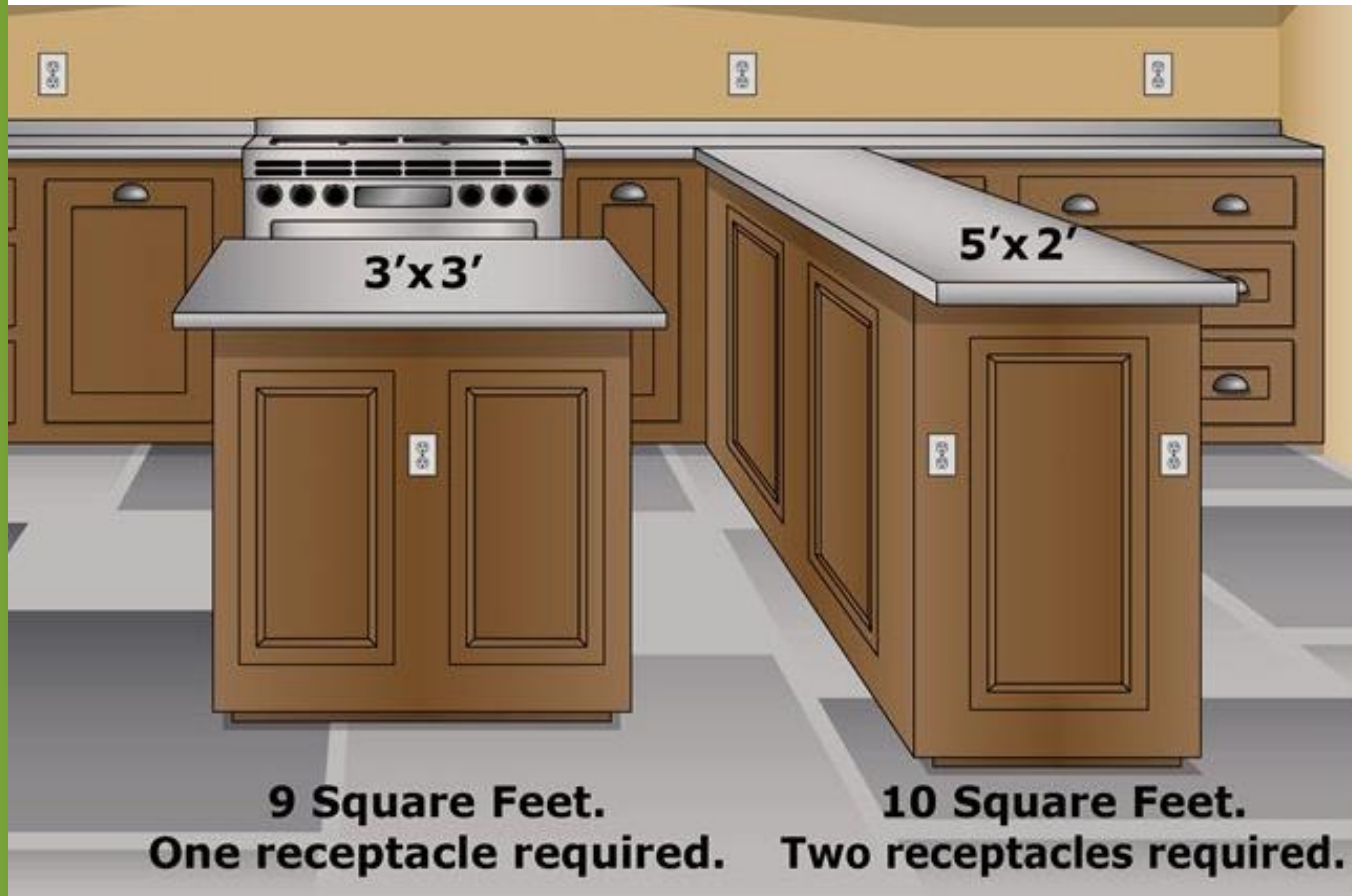


210.52(C) Countertop and Work Surfaces.



Multioutlet Receptacle Assembly
is cut to fit and field-installed by
a licensed professional.

210.52(C)(2) Island and Peninsular Countertops and Work Surfaces.

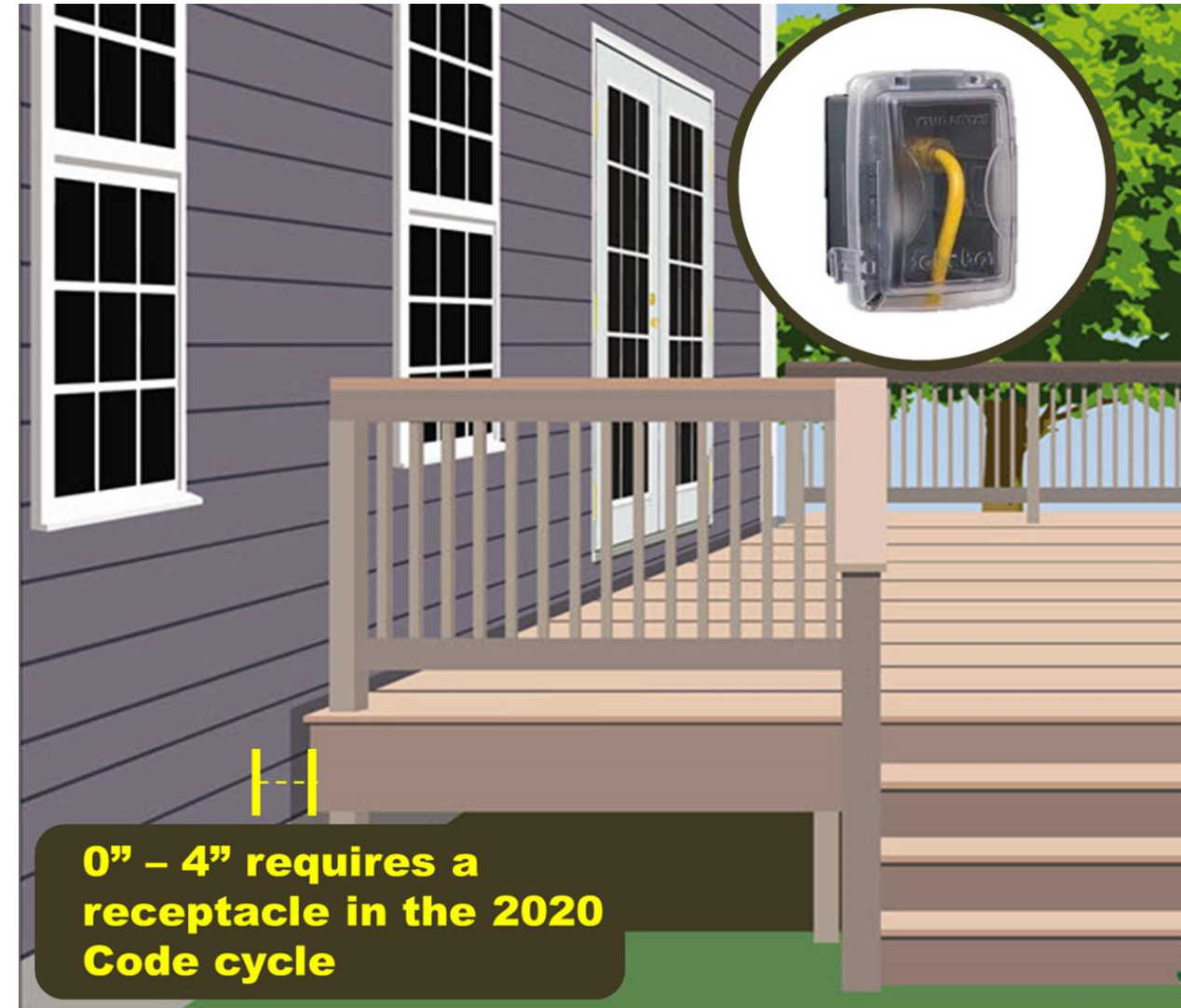


In the 2020 NEC—

- At least one receptacle outlet must serve the first 9 square feet of countertop.
- An additional outlet is then required for each additional 18 square feet of countertop.
- One receptacle must be located within 2 feet of the outer peninsula end.

210.52(E)(3) Receptacle Outlet for Balconies, Decks, and Porches.

- In the 2020 NEC— Any deck within 4 inches horizontally of a dwelling unit must have a receptacle outlet accessible from the deck.
- Previously, decks with even a ½” air gap were not technically attached to the dwelling and were exempt from this requirement.



220.12 and Table 220.12- Lighting Load for Non-Dwelling Occupancies.

TABLE 220.12 GENERAL LIGHTING LOADS BY NON-DWELLING OCCUPANCY		
TYPE OF OCCUPANCY	UNIT LOAD	
	Volt-amperes/m2	Volt-amperes/ft2
Automotive facility	16	1.5
Convention center	15	1.4
Courthouse	15	1.4
Dormitory	16	1.5
Exercise center	15	1.4
Fire station	14	1.3
Gymnasium	18	1.7
Health care clinic	17	1.6
Hospital	17	1.6
Hotels and motels, including apartment houses without provisions for cooking by tenants	18	1.7
Library	16	1.5
Manufacturing facility	24	2.2
Motion picture theater	17	1.6
Museum	17	1.6
Office	14	1.3
Parking garage	3	0.3
Penitentiary	13	1.2
Performing arts theater	16	1.5
Police station	14	1.3
Post office	17	1.6
Religious facility	24	2.2
Restaurant	16	1.5
Retail	20	1.9
School/university	33	3
Sports arena	33	3
Town hall	15	1.4
Transportation	13	1.2
Warehouse	13	1.2
Workshop	18	1.7

2020 NEC moved all dwelling unit info from NEC 220.12 to NEC 220.14(J). 220.12 expanded to 29 occupancies. The 125% multiplier for continuous loads is now included in Table 220.12. Motors less than 1/8 hp and connected to lighting circuits are now part of the general lighting load of a service calculation.

220.14(J) Unit Loads for Dwelling Units.

- In the 2020 NEC, 220.14(J) contains all dwelling unit information for performing a service calculation.
- The general lighting load for a dwelling is still 3 VA for each square foot, excluding porches, garages, and unused or unfinished spaces not adaptable for future use.
- Motors less than 1/8 hp and powered by lighting circuits (such as bath fans) are now included in the general lighting load of the dwelling service calculation.



220.53 Appliance Load - Dwelling Units.

- In the 2020 NEC, a demand factor of 75% can only be applied to four or more appliances when they are rated $\frac{1}{4}$ hp or greater, or 500 watts or greater.
- The 75% appliance demand factor had no such restriction in the 2017 NEC.



225.10 Wiring on Buildings (or Other Structures).



- In the 2020 NEC the term “multiconductor cable” has been replaced with specific cable Types: SE and TC-ER Cable.
- Both SE (Service-Entrance) and TC-ER (Tray-Cable with Crush-Proof Outer Jacket) are now approved as outdoor wiring methods.