Ground, Neutral and Hot Wires Explained

This work sheet has been developed for use with the instructional video from The Engineering Mindset.com. Click on the provided link to access the video. Teachers, use this answer key to develop the work sheet used by your students.

<https://youtu.be/P-W42tk-fWc>

1. Those working with electrical circuits should be \_\_\_\_\_qualified\_\_\_\_\_ and \_\_\_\_\_competent\_\_\_\_\_\_ to carry out electrical work.
2. Electricity will only \_\_\_\_flow\_\_\_\_ in a complete \_\_\_\_\_circuit\_\_\_\_\_.
3. If you come into contact with an electrical conductor, your body might \_\_\_\_\_complete\_\_\_\_\_\_ the \_\_\_\_\_circuit\_\_\_\_\_\_\_.
4. Electricity always tries to return to its \_\_\_\_\_source\_\_\_\_\_\_.
5. Electricity takes all available \_\_\_\_\_paths\_\_\_\_\_ to complete a circuit. It takes preference to a path with less \_\_\_\_\_\_\_resistance\_\_\_\_\_\_\_ and more \_\_\_\_\_\_current\_\_\_\_\_\_ flow in that path.
6. Electron flow in a DC circuit is normally \_\_\_negative\_\_\_\_ to \_\_\_\_\_\_positive\_\_\_\_\_\_.
7. The \_\_hot\_\_\_ wire supplies current to the load. The \_\_\_\_neutral\_\_\_\_\_ wire returns current to the \_\_\_\_\_source\_\_\_\_\_.
8. In a DC circuit, electrons flow in \_\_\_one\_\_\_ direction.
9. In an AC circuit, the current \_\_\_\_\_alternates\_\_\_\_\_\_\_ direction.
10. In North America, there is a \_\_\_\_split\_\_\_\_ \_\_\_phase\_\_\_ supply of electricity to most property consisting of two \_\_\_hot\_\_\_\_ wires and one \_\_\_\_neutral\_\_\_\_.
11. The two coils in a transformer are rated at \_\_\_120 volts\_\_\_ each.
12. When using the full length of the transformer coil, voltage is \_\_\_\_240 volts\_\_\_\_.
13. Current, or amperage, may be measured with a \_\_\_clamp\_\_\_ \_\_\_meter\_\_\_.
14. If a load of 20 amps is on one half of a transformer coil in a poly phase system the hot wire will carry \_\_20\_\_ amps and the neutral wire will carry \_\_20\_\_ amps.
15. If one \_\_phase\_\_\_ or one half of transformer coil in a poly phase system carries a 20-amp load and the other phase, or other half, carries a 15-amp load, the load on the neutral wire will be \_\_5\_\_ amps.
16. If both sides of the transformer coil carry an \_equal\_ load, the load on the neutral wire will be \_\_0\_\_ amps.
17. Under normal operating conditions, the \_\_\_ground\_\_\_\_ wire will carry no \_\_electrical\_ \_ \_\_current\_\_.
18. The \_\_ground\_\_ wire will only carry \_\_current\_\_ in the event of a \_\_ground\_\_ \_\_fault\_\_.
19. Ground wires have very low \_\_resistance\_\_ so electricity will prefer to follow it.
20. When current finds a way to leave its circuit and return to its source by a means other than the neutral wire, this is known as a \_\_ground\_\_ \_\_ fault\_\_.
21. Ground wires should be \_\_connected\_\_ to anything that could become a \_\_potential\_\_ \_\_path\_\_ for current to leave its circuit including \_\_metal pipes\_\_, \_\_cover \_\_ \_\_plates\_\_, \_\_light\_\_ \_\_switches\_\_, \_\_outlets\_\_ and \_\_boxes\_\_.
22. GFCI stands for \_\_\_\_\_Ground Faut Circuit Interrupter\_\_\_\_\_.
23. When a GFCI breaker is connected to a circuit, the hot wire and the neutral wire should carry an \_\_equal\_\_ load, when the load is not equal, a \_\_ground fault\_\_ is sensed by the GFCI breaker and it \_\_trips\_\_.
24. Ground rods are used to \_\_dissipate\_\_ static electricity and \_\_lightning\_\_ \_\_strikes\_\_ and are not designed to carry \_\_ground\_\_ \_\_faults\_\_.
25. Ground rods do not normally take the path through the \_\_grounding\_\_ \_\_conductor\_\_ to the \_\_ground\_\_ \_\_rod\_\_ because of \_\_high\_\_ \_\_resistance\_\_ and electricity prefers the path of \_\_less\_\_ \_\_resistance\_\_.