Lesson #3: Portable Drill Identification and Safety

Objectives

Students will be able to…

- Identify the portable drill's major components and safety operation.

Common Core Standards

LS 11-12.6
RSIT 11-12.2
RLST 11-12.2
Health and Safety 6.0, 6.2, 6.3, 6.5, 6.6
Technical Knowledge and Skills 10.0, 10.1, 10.2
Demonstration and Application 11.1
Cabinetmaking and Wood Products Pathway A4.1, 4.3, & A4.4
Residential and Commercial Construction Pathway D2.1, D3.1, D3.2, D3.3

Materials

Portable Drill Identification and Safety Worksheet

Lesson Sequence

- Complete the ***Portable Drill Identification and Safety Worksheet*** with students gathered around the drill. As the parts of the drill, not only discuss what their function is, but also demonstrate how they function. (30 minutes)
- Return to the classroom and have students work on the safety questions. (15-20 minutes)

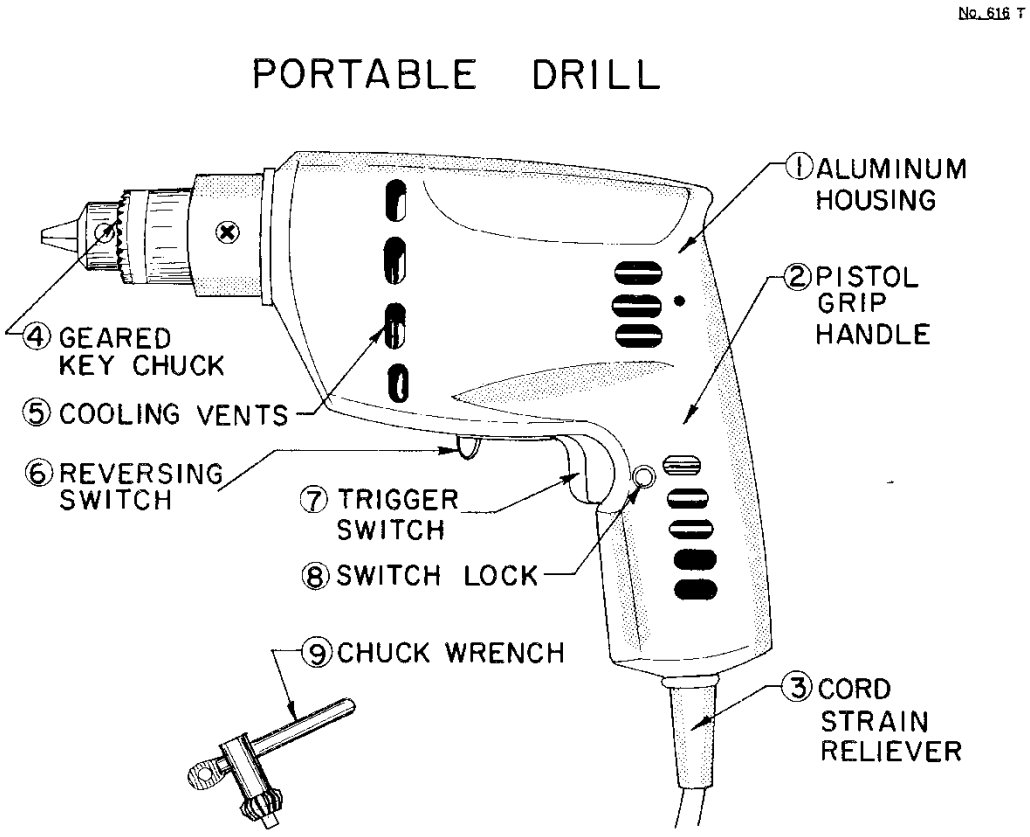
Assessment

Monitor student learning through questioning. Monitor student learning by roaming around the classroom while students are working on their safety questions.

Accommodations / Modifications
-One on One Support -Partner as Needed -Check for Understanding

Portable Drill Identification and Safety Worksheet

Part 1: Identify the numbered parts on the drill illustrated below.



1. _____
2. _____
3. _____
4. _____
5. _____
6. _____
7. _____
8. _____
9. _____

Part 2: General Safety Practices

1. Never wear a tie or loose clothing or jewelry when using a portable power drill. Tie long hair back or secure under a cap. Always wear safety glasses or goggles when drilling.
2. Wear proper eye and hearing protection.
3. Do not overreach – always keep proper footing and balance. Do not reach under or around material being drilled.
4. Do not drill with one hand while holding the material with the other.
5. Thoroughly review and understand information provided in the portable power drill operator's manual with particular attention given to descriptions of safety procedures.
6. Examine your drill to make sure that it is clean.
7. Use caution when changing drill bits, as they are sharp and can become hot during use
8. Never carry a portable power drill by the power cord.
9. When carrying a portable power drill, turn the drill off and keep your index finger away from the power switch.
10. Never stop the rotation of the drill chuck or bit with your hands or fingers.
11. Keep hands and fingers well clear of moving parts. Avoid blocking & covering the motor ventilation slots with your hands.
12. Always clean your work area upon completion of the drilling task.

Part 3: Safe Operating Precautions

13. Do not operate a portable power drill in the presence of flammable fumes. Drilling into a container that may have once contained or does contain flammable materials could cause a fire or explosion.
14. Use the correct drill bit for the type of material to be drilled and task at hand. Do not use high-speed steel bits, those used in masonry and steel, without cooling or lubrication.
15. Make all portable power drill adjustments with the power switch off and the drill unplugged.
16. Insert bit into drill chuck and tighten with the chuck key in each of the three holes. Remove chuck key from the drill chuck before starting the portable power drill.
17. Always use the type of battery or battery pack specified for the portable power drill.
18. Never carry a portable power drill by the power cord.
19. When carrying a portable power drill, turn the drill off and keep your index finger away from the power switch.

20. Never stop the rotation of the drill chuck or bit with your hands or fingers.
21. Starting the drilling at the right angle and keeping straight, takes steadiness and care. If a drill isn't held just right, the bit may bend or break, sending metal flying.
22. When possible, always secure your work on a stable platform using clamps or vices. A secured work piece will help ensure straight drilling.
23. Prior to beginning drilling operations, inspect each work piece for nails, knots, or flaws that could cause the tool to buck or jump.
24. Hold the portable electric drill motor firmly with both hands at all times when drilling.
25. Use the proper speed for the material you are drilling: a drill bit with a smaller diameter will require an rpm speed that is slower than a bit that has a larger diameter. Do not exceed the manufacturer's recommended maximum drilling capacities.
26. Feed the drill into the material at a constant rate.
27. Turn off the drill and wait for it to come to a complete stop before clearing sawdust off the table.
28. The power drill must be held firmly with both hands to control operational accuracy and the rotational torque.
29. Allow the drill to reach operating speed, then apply load gradually using the trigger switch.
30. Avoid prolonged use as this could overheat the motor.
31. Turn off after backing out the drill bit. Do not place the drill down until the bit has stopped rotating.
32. Keep drill vents clear to maintain adequate drill ventilation.
33. Keep drill bits sharp at all times. Do not use a bent or damaged drill bit.
34. Keep electrical cords clear of the drilling area.
35. Slow the rate of feed before breaking through the surface.
36. Drill a small pilot hole before drilling large holes.

Part 4: Complete the Questions

1. Ensure that the _____ has been removed from the equipment before operation.
2. after every drilling job, turn off the _____ and _____the power cord.
3. To obtain holes that are placed accurately, drill a small _____ first then drill the final hole.
4. Maintain good _____at all times when drilling.
5. _____down the material being drilled to prevent any movements while drilling.
1. 6. Try to maintain the drill perpendicular to the work piece. Incorrect operating _____ may increase the possibility of drill grab or the drill bit breaking.
6. Always ensure that the drill has _____rotating before it has been put down.
7. Remember to remove the _____ before switching on the drill for best results.
8. You will need to keep the _____ clear in order to maintain adequate drill-ventilation otherwise the drill may heat-up and end-up burning your hands
9. Don't use high-speed bits without cooling or _____ the drill.
10. Don't drill with _____ while using the other hand to hold the material.
11. Never change drill bits when the power cord is still _____to the power supply.
12. Depending on the job and the material, ensure that you use the _____drill bit.

Portable Drill Identification and Safety Worksheet - *Answer Key*

Part 1:

1. Aluminum house
2. Pistol grip handle
3. Cord strain reliever
4. Geared key chuck
5. Cooling vents
6. Reversing switch
7. Trigger switch
8. Switch lock
9. Chuck wrench

Part 4:

1. Chuck key
2. Switch and unplug
3. Pilot hole
4. Balance
5. Clamp
6. Angle
7. Stopped
8. Chunk-key
9. Drill-vents
10. Lubricating
11. One hand
12. Connected
13. correct