

# Project 1.2.5 Let's Get Technical

RYOBI PORTABLE ELECTRIC POWER LEAF BLOWER

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**18V ONE+™ BLOWER**

This RYOBI 18-Volt ONE+ Cordless Blower is perfect for hard surfaces, blasting away leaves and debris at 200 CFM and 90 MPH. The compact, lightweight design makes it easy to handle and reduces fatigue. With cordless convenience you gain increased mobility without the hassle of gas and oil. Best of all, the included 18-Volt battery is compatible with over 100 tools in the RYOBI ONE+ family. (Ryobi.com)



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## Project 1.2.5 PPE Template

Identify the PPE needed for each tool. Record the name of the PPE and its purpose in Table 1.

**Table 1. PPE Requirements**

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Tool	PPE	Purpose
<b>Power Tool</b>	Safety Glasses	To limit debris in your eyes
<b>*Ryobi 18V Leaf Blower</b>	Hearing Protection	To reduce the decibel impact of the blower which is near 85.
	Dust Mask	To reduce intake of allergens and particulates

**Tool Safety Checklist**

Tool Name: \_\_\_\_\_ Ryobi Portable power leaf blower \_\_\_\_\_

**Non-Mechanical Hazards**

Is there a potential noise hazard?	<input checked="" type="checkbox"/> <b>Yes</b>	<input type="checkbox"/> <b>No</b>	If yes, what PPE is needed? <b>Ear plugs</b>
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Is there potential hazard of harmful substances produced using the machine?	<input type="checkbox"/> Yes	<input checked="" type="checkbox"/> No	If yes, what PPE is needed?
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Power Source		Power Transmission		Point of Operation	
	<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No		<input type="checkbox"/> Yes <input type="checkbox"/> No
Are there loose conduit or fittings?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Are there any unguarded gears, sprockets, pulleys, or flywheels?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Is there a point of operation safeguard for the machine?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is machine properly grounded?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Are any exposed belts or chain drives?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No	Does it keep operator's hand, fingers, and body out of danger?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No
Is power supply correctly fused and protected?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Are starting and stopping controls within reach of operator?	<input checked="" type="checkbox"/> Yes <input type="checkbox"/> No	Have safeguards been tampered with or removed?	<input type="checkbox"/> Yes <input checked="" type="checkbox"/> No

Place a check by any motions or actions that are potential hazards for each component. Record the PPE that should be worn and the type of guard in place to prevent injury from that action or motion.

Action or Motion	Power Transmission		Point of Operation		
	<input type="checkbox"/>	Recommended PPE	Type of Guard in Place	Recommended PPE	Type of Guard in Place
Rotating	<input checked="" type="checkbox"/>	Safety glasses	Motor cover	<input type="checkbox"/> NA	NA
In-Running Nip Points	<input type="checkbox"/>			<input type="checkbox"/>	
Reciprocating	<input type="checkbox"/>			<input type="checkbox"/>	
Transversing	<input type="checkbox"/>			<input type="checkbox"/>	
Cutting	<input type="checkbox"/>			<input type="checkbox"/>	

Punching	<input type="checkbox"/>			<input type="checkbox"/>		
Shearing	<input type="checkbox"/>			<input type="checkbox"/>		
Bending	<input type="checkbox"/>			<input type="checkbox"/>		
What are the recommended changes to the components before using the tool? <b>Make sure the nozzles are tightly secured and it is on the proper setting for the application (high/low).</b>						
What hazards should the operator be aware of before using the tool? <b>High pressure air, noise, flying dust and debris.</b>						

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# Tool Operation Template

Record the information for each step of the tool operation process.

**Name of the Tool:** \_\_\_\_\_ **Ryobi Electric Leaf Blower** \_\_\_\_\_

**PPE Requirements**

Record the PPE needed and a reason for each.

- Hearing protection
- Safety glasses
- Dust mask (if needed)

**Clothing and Grooming Requirements**

Explain how and where loose clothing and hair could be caught in the tool.

- The spinning electrical motor/fan

**Environment**

Explain the environmental requirements for safe use, such as lighting and ventilation.

- This device should only be used outdoors, in an environment in which dust and rapid air movement are acceptable

**Tool Attachments**

List the attachments, such as bits and blades used and purpose of each.

- Blower extension, nozzle pieces of varying sizes to open or restrict flow to increase pressure or surface area applied.

**Material**

What type of materials does this tool work on?

- Any loose material: leaves, dust, small particles, pooled water, small debris, etc.

## **Fastening**

Explain how material should be fastened before working on it with the tool.

- Any objects you don't want moved or effected by the high pressure air should be moved out of the air.

## Settings

Describe the settings on the machine and list the steps for setting them.

- High/low: turn the dial on the upper shaft to increase or decrease the air flow while machine is off.
- Apply direct pressure to the trigger while maintaining a firm grip on the device and pointing it in the desired direction, away from other people.

## Power Supply

Explain how to inspect the power supply for risk of injury. Describe how and when you turn the machine on.

- Remove the battery and inspect the metal prongs for corrosion as well as the connection on the machine.
- Inspect the battery cover for damage (swelling, breakage, exposed wiring).

## Personal Positioning

Where should you stand while turning on and operating the machine? Where should others be standing?

- Stand behind the machine with a firm grip pointing the machine in the direction of the material you are wanting to move, approximately 1-2' away.
- Make sure others are not standing in front of the machine or in the path of airflow.

## Use

How do you properly operate the machine?

- Only use it for the uses intended by the manufacturers
- Do not modify or alter in any way not intended by the manufacturers
- Apply full pressure evenly to the trigger and move evenly from side to side in an even path to clear desired area.

## Shutting Down

How and when do you shut down the machine?

- To shut down the machine you just release the trigger.

## Storage

How do you clean, inspect, and store the tool?

- To clean the tool you need to clear the vents on the motor housing, check the blower shafts for breakage or loose connections.
- To store the tool, remove the battery and place in a safe dry area where it cannot fall or increase chance of corrosion.

## Project 1.2.5 Maintenance Job Sheet

Research the maintenance requirements for your assigned power tool or stationary tool. Record your information in a format you see appropriate for a technical manual. Use *Activity 6.2.1 Maintenance Plan* as a reference.

1. Record any fluids, if applicable, used to cool or lubricate the tool in Table 1.
2. Explain the purpose of the fluid in Table 1.
3. Record a minimum of six maintenance tasks for your tool.
4. Research and record the purpose, tools needed, materials, and frequency for each task.
5. Choose two tasks to explain in detail.
6. List the steps for completing your chosen two tasks

**Table 1. Fluids**

Fluid	Purpose
NA	No fluids are required for cooling this tool.

Maintenance Tasks	Purpose	Tools/materials needed	Frequency
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Cleaning filter	Improve air flow	Air hose	Once/4 uses
Charge battery	To allow for machine function	Battery Charger	After each use
Clean nozzles	To reduce deposition and potential pitting and fitting issues	Wet cotton cloth	Once/season or as needed
Clean battery connections	To improve connection between battery and the motor	Brass wire brush or emery cloth, vinegar and a cotton swab.	Once/season
Check battery for wear/cracks/swelling	To ensure the health and quality of the battery	Your own eyes for a visual inspection	After each charge.
Check motor for particulates or wear	To improve motor life and reduce unnecessary noise	Philips screwdriver, ears.	As needed.

### Detailed Maintenance tasks:

1. Charging battery
  - 1) Remove the battery from the blower by squeezing the release buttons on either long side of the battery and pulling straight out.
  - 2) Visually inspect the battery for swells and cracks. If none, proceed to charging
  - 3) Plug in the charger to a 110V wall outlet. Look for a solid red light.
  - 4) Place the battery into the charger by lining up the prongs, it should lock into place if correct and will have a blinking red light to read the charge.
  - 5) To charge, leave in the charger until the light turns a solid green, approximately 2hours for a fully

discharged battery.

2. Cleaning battery connections

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## Project 1.2.5 Energy Template

Research the types of energy that power each of your assigned tools.

7. Record the type(s) of potential and kinetic energy that power each tool.
8. Identify the location of that energy type on the tool in Table 1.

**Table 1. Types of Energy**

Tool	Potential Energy	Kinetic Energy	Location
Battery- Stored Chemical Energy		Battery Pack at end of handle	
	Motor Spinning	Just anterior of the handle and throttle, inside the housing.	

## Project 1.2.5 Simple Machines Job Sheet

Research the types of simple machines on each of your assigned tools. Sketch each tool in the space below and label each simple machine.

### Power Tool

- **Wheel and axle:**
  - The electric motor and shaft act as a wheel and axle transferring the potential energy of the battery into kinetic energy to spin the motor shaft then rotating the fan blades creating the air movement
- **Lever:**
  - The throttle switch acts as a lever. When force is applied it then transfers force along a secondary lever which then applies a force to the electromagnet to turn the motor.

## Project 1.2.5 Materials Template

Research the types of materials found on each of your assigned tools.

9. Identify the types of plastic, metal, and wood found in each tool and record in Table 1.
10. Identify where each material can be found on the tool and record in Table 1. it is located.
11. Record the purpose of each material found on the tool.

**Table 1. Materials**

<b>Tool</b>	<b>Material</b>	<b>Location</b>	<b>Purpose</b>
<b>Power Tool</b>	Plastic	Housing, nozzles, handles, blower blades, electric motor blades, etc.	Lightweight, inexpensive, resists heating, insulation of heat and wiring.
	Metal	Shaft	Turn the motor blades to create the air movement
		Connectors	Keep components together without shearing. Easier to remove and replace.
		Battery terminals	To conduct electricity into the motor and switch
		Electrical wiring	To power the components and communicate between the switch and them.

## Project 1.2.5 Fabrication Template

Research the types of attachments used on each of your assigned tools. Attachments may be used to cut, shape, fasten, or fuse material.

12. Record the name and a description of each attachment in Table 1.

13. If applicable Record the types of material the attachment is designed to cut or shape in Table 1.

14. If applicable Record the types of fasteners the attachment is designed for in Table 1.

**Table 1. Cutting Attachments**

<b>Tool</b>	<b>Name</b>	<b>Description</b>	<b>Material</b>	<b>Fasteners</b>
<b>Power Tool</b>	Ryobi Blower	Narrow tips (high pressure)	Plastic	NA
		Extension pipe	Plastic	NA
		Wider nozzle	Plastic	NA

## Project 1.2.5 Troubleshooting Job Sheet

Develop a troubleshooting chart for your assigned power tool or stationary tool. Use the troubleshooting chart written for *Activity 6.2.2 Troubleshooting* as a guide. The troubleshooting chart should meet the following criteria.

**Table 1. Problem Identification**

Component	Energy Type	Ranking	Potential Problems
Battery	Potential Chemical	1	Not charged/improper charge
		3	Swelling/breakage
		2	Bad connection
Motor	Kinetic	3	Not engaging
		1	Wrong speed
		2	Loose/imbalanced
Nozzle/blow er	Kinetic	3	Clogged
		1	Not enough airflow
		2	Rattling/vibration
Throttle switch	kinetic	1	Loose/ stuck
		2	Improper pressure sensitivity
		3	Bad connection (not engaging)

**Table 2. Potential Solutions**

Problems	Solutions
Improper charge	Test with voltmeter, properly charge.
No sustained motor movement	Check battery connections or for debris in motor.
Lack of sufficient airflow	Loose nozzle connections.
Wrong speed	Adjust High or low power setting.
Excess vibration	Check motor tightness or screw tightness on housing
Throttle switch not engaging	Check play in throttle, tighten screws.

**Ryobi.com**

**Homedepot.com**

**CASE-APT Curriculum**

**Project 1.2.5 Templates**

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