Small engines power our lives for work and play. Learn how small engines work, how to maintain and repair them, and how to apply this information to a hobby or career.

- Learn basic to advanced information about small engines.
- Learn life skills such as planning, organizing, comparing and measuring, decision making, communication, safety and problem solving.

**Here’s what you can do all year!**

<table>
<thead>
<tr>
<th>Starting Out Basic/Level 1</th>
<th>Learning More Intermediate/Level 2</th>
<th>Expanding Horizons Advanced/Level 3</th>
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<tbody>
<tr>
<td>Identify parts of a small engine.</td>
<td>Identify small-engine types.</td>
<td>Identify small engines by sound.</td>
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<tr>
<td>Start an engine.</td>
<td>Identify internal small-engine parts.</td>
<td>Identify and use diagnostic tools.</td>
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<tr>
<td>Identify tools used with small engines.</td>
<td>Identify specialty tools.</td>
<td>Learn to assemble and tear down an engine.</td>
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<tr>
<td>Identify and use safety equipment.</td>
<td>Test the compression of an engine.</td>
<td>Learn to tear down and rebuild an engine’s electrical system.</td>
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<tr>
<td>Understand oil grades.</td>
<td>Be able to clean a carburetor and understand carburation.</td>
<td>Maintain work machines.</td>
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<tr>
<td>Understand and perform deck maintenance procedures.</td>
<td>Learn to season a small engine.</td>
<td>Investigate trends in the small-engines industry.</td>
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<tr>
<td>Understand water and air cooling systems.</td>
<td>Understand transmission of power in the engine.</td>
<td>Learn about rules pertaining to small engines.</td>
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<tr>
<td>Learn to perform engine maintenance on spark plugs, air cleaners and carburetors.</td>
<td>Understand a machine’s center of gravity.</td>
<td>Select a replacement engine.</td>
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<tr>
<td>Match the machine to the job.</td>
<td>Obtain information about careers related to small engines.</td>
<td>Start your own business.</td>
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<tr>
<td>Compare how different cuts affect grass growth.</td>
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<tr>
<td>Determine engine size.</td>
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</tbody>
</table>

Learn more at [www.ndsu.edu/4h/](http://www.ndsu.edu/4h/) or contact your county NDSU Ex-

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Pass it on!
Now that you know how, share it with others. Here are ideas to get you started.

**Communication**
- Present a demonstration or speech at your area 4-H communication arts contest.
- Provide a small-engine safety seminar during a community event.

**Citizenship**
- Help a friend or family member maintain or repair a small engine.
- Organize a group to mow lawns for elderly homeowners.

**Leadership**
- Plan a tour for your 4-H club of a mechanic shop or lawn-care business in your community.
- Organize a small-engine tune-up day, with proceeds going to a local charity or donate labor for the underprivileged or less fortunate.

**Entrepreneurship**
- Start a lawn-mowing business.
- Job shadow a mechanic or lawn care business owner for a day.
Opportunities to explore small engines:

- Give a presentation or demonstration on small engines at your club meeting and communication arts event.
- Teach younger 4-H members in your club about small engines by playing small-engine bingo.
- Research careers that work with small engines.
- Research education requirements for working with small engines.
- Visit a mechanic shop.
- Attend local workshops or tradeshows.
- Interested in a college education in engineering or landscape architecture? Schedule a visit with North Dakota State University, [www.ndsu.edu](http://www.ndsu.edu).

### 4-H Resources

- **National 4-H Small Engines Curriculum:**
  - [Crank It Up!](HCG101) (HCG101)
  - [Warm It Up!](HCG102) (HCG102)
  - [Tune It Up!](HCG103) (HCG103)
  - [Helper’s Guide](HCG256)
  - [Online Curriculum](www.ndsu.edu/4h)

- **Educational Trunk**
  - The Advanced Engine Trunk comes in two Stanley tool chests with wheels and requires a pickup or van to carry. *(Reserve through your county Extension office.)*

### Other Resources

- [Four-stroke Combustion Engine](www.4H.org)
- [Howstuffworks](https://www.howstuffworks.com)
- [John Deere Kids](www.johndeere.com/kids)
- [API (American Petroleum Institute)](www.api.org)
- [ASABE](www.asabe.org)
- [The Lawn Institute](www.lawn.org)
- [Outdoor Power Equipment Institute](www.opei.org)
- [Professional Lawn Care Network](www.plcn.org)
- [SAE (Society of Automotive Engineers)](www.sae.org)

### Recordkeeping

- [Planning for My Project Adventure](PA093)
- [ND 4-H Project Plan](PA095)
- [ND 4-H Plan of Action](PA096)
- [ND 4-H Participation Summary for 11- to 19-year-olds](PA098)

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**Exhibit Ideas**

- Create a poster on small engine safety or maintenance.
- Display proper and improper or defective plugs.
- Create a poster or display demonstrating routine repair and maintenance.
- Display a small engine you overhauled or repaired.
- Display a reconstructed engine in good running order.
- Create a safety poster on any lawn and garden equipment.
- Create a poster on how an engine runs.
- Display maintenance or equipment operations (gears, belts, etc.).
- Create a display comparing 2- and 4-cycle engines.
- Display lawn and garden equipment or some other application of small engines.