



## WEATHERIZATION

### TOPIC OF STUDY

Auditing



90 MINUTES

### KEY TERMS

manometer  
calibrated fan  
depressurization  
infiltration  
exfiltration  
Pascal (Pa)  
CFM  
CFM<sub>50</sub>  
CMF<sub>natural</sub>

## LESSON

Blower Door Lab

## BIG IDEA(S)

A blower door system uses air depressurization to find air leakages in the home.

## OBJECTIVES

Students will:

- Correctly determine home safety, set up a blower door, set up a manometer, operate the blower door
- Accurately use a manometer to measure pressure differences in Pascals between inside and outside of the house
- Find an example of infiltration using appropriate tools (skin sensation, smoke wand, infrared gun, etc.)
- Calculate overall air leakage

## TASK LIST SUBCATEGORY

805 Perform the energy audit procedure including set up and use of a blower door test

## OVERVIEW

The Blower Door is special equipment that building analysts use when evaluating a home's energy performance. A large fan is placed on an exterior door to measure the leakiness of the house by depressuring the interior and blowing the air outside. Using special tools, the analyst determines the location and estimates the size of leaks.

## STANDARDS

### PA/SDP

**3.1.12.D.** Analyze scale as a way of relating concepts and ideas to one another by some measure; Analyze and apply appropriate measurement scales when collecting data.

**3.2.12.D.** Analyze and use the technological design process to solve problems. Assess all aspects of the problem, prioritize the necessary information and formulate questions that must be answered.

**3.4.12.E7.** Analyze the technologies of prefabrication and new structural materials and processes as they pertain to constructing the modern world.

## INSTRUCTIONAL

### TEXT/REFERENCES

*Energy Conservation Handbook.* pp. 65-67, 198-199

### MATERIALS NEEDED

**Teacher Presentation:** Determine optimal number of students who will be present during the lab. Repeat with additional group(s) as needed.

### MATERIALS

- all blower door equipment and accessories
- lab test house





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## IMPLEMENTATION (LESSON PLAN)

1. Review the purpose for a blower door test
2. Display and review all parts of the equipment needed.
3. Tour the test house and discuss needed preparation and hazards for the test.
4. Demonstrate set up the blower door – encourage students to predict the steps in the process. Disassemble with the help of students and then have each student complete the installation. Have the other students watch each installation and offer coaching and feedback to their peers.
5. Set up the manometer and show the baseline reading. Review how the manometer works as you demonstrate.
6. Operate the blower door according to the procedure on p. 66-67 and demonstrate the data parameters.
7. Have students examine areas of leakage using methods demonstrated.
8. Demonstrate metric calculations based on data collected.

## RESOURCES/LINKS

### Blower Door Test Demo

Part I [https://www.youtube.com/watch?v=67v\\_rTaZmOA](https://www.youtube.com/watch?v=67v_rTaZmOA)

Part II <https://www.youtube.com/watch?v=x-RKcXwB8bQ>

