# Windows and Doors

# Weatherization Installer/Technician Fundamentals

Learning Objectives

By attending this session, participants will be able to:

* List correct window terminology.
* State how windows lose and gain heat.
* Explain savings-to-investment ratio for window and door replacement compared to other building shell retrofits.
* Identify various methods and materials for window and door treatments.
* Discuss recommended window and door replacement criteria.
* Identify methods and techniques for replacing windows and doors.

Key Terminology

Air leakage

Awning window

Casement window

Conduction

Convection

Domestic hot water tank (DHWT)

**Door casing**

Door stop

Double-hung window

Glass pane

Glazing

Head jamb

**Hinges**

**Jambs**

Lead-safe weatherization work practices

Low-e

Lower sash

Mullions

National Fenestration Rating Council (NFRC)

Panel

Picture window

Radiation

Rails

Reglazing

Sash

Savings-to-investment ratio (SIR)

Side jamb

Sill

Slider window

Solar heat gain coefficient (SHGC)

Stiles

Thermal break

Thermal transmittance

Threshold

Trim

U-Factor

Upper sash

Visible transmittance

Window stop

Supplemental Materials

Handouts & Resources

“12 Steps to Lead Safety.” *WxTV.* Montana Weatherization Training Center. <www.wxtvonline.org>.

Efficient Windows Collaborative Website: <www.efficientwindows.org>.

Heat Loss Calculation Worksheet.

Klems, Joseph H. “Measured Winter Performance of Storm Windows.” *Paper LBNL-51453*. Lawrence Berkeley National Laboratory, 23 August 2002. <www.escholarship.org>.

Morrison, Daniel. “Get the Right Replacement Window.” *Fine Home Building* Oct./Nov. 2004. <www.finehomebuilding.com>.

Savings to Investment Ratio Worksheet.

U.S. Department of Energy. “Selecting Windows for Energy Efficiency.” *DOE/GO-DE-AC03-76SF00098 Pub-788*. U.S. Department of Energy. Jan. 1997.

Weatherstripping Prop Guide.

Windowpane Prop Guide.

On-line Platform Lessons

Use these on-line interactive training modules as pre-requisites before students attend the course, or as in-class computer lab sessions. Users must first create an account at [www.nterlearning.org](http://www.nterlearning.org) to access.

i- 6.4 Weatherizing Windows and Doors <https://www.nterlearning.org/web/guest/course-details?cid=2005>

Relevant Standard Work Specifications

1.000.1 – Global Worker Safety
3.1200 – Windows and Doors (All details within this topic)

Classroom Props & Activities

* Small double-hung window unit showing various window treatments
* Small in-jamb vinyl replacement window unit
* Selection of window and door weatherstripping materials

Hands-On Props

Weatherstripping Prop: Students gain hands-on experience installing door sweeps and weatherstripping. Reference the Weatherstripping Prop Guide.

Windowpane Prop: Demonstrate and then allow students to practice repairing a broken windowpane. Reference the Windowpane Prop Guide.

Class Overview

Deliver the presentation to introduce students to the concepts of SIR in relation to window and door replacements, when replacements make sense, window rating categories, and proper installation techniques. Engage students by asking leading questions about their perception of the relative impact windows and doors have on heat loss and gain in the home. Discuss what the NFRC labels tell us in terms of heat transmission and visibility.