

Wood Flooring in Commercial Spaces

Presented By: First Lastname
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Course Description



This course assists architect and design professionals in understanding the physical properties and characteristics of wood and the variables that should be considered when specifying it as flooring for their commercial client projects.

Learning Objectives



- Understand the physical properties, characteristics of hardwood, softwood
- Describe variables considered when wood flooring is used in commercial spaces
- Identify which wood floors perform best in commercial applications
- Discuss potential issues that could arise when using wood flooring in commercial settings
- Recommend maintenance procedures for commercial wood floors



Physical Properties



Physical Properties



- Hardwood trees
 - Produce leaves
 - Deciduous



- Softwood trees
 - Produce needles
 - Coniferous

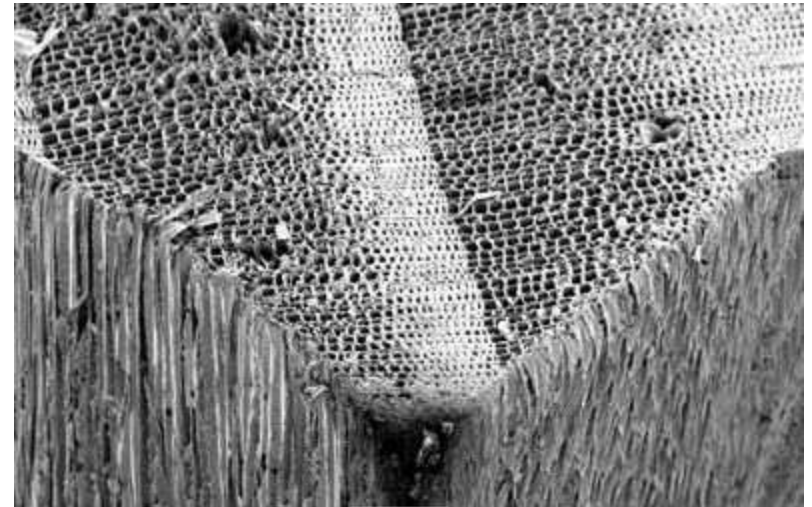
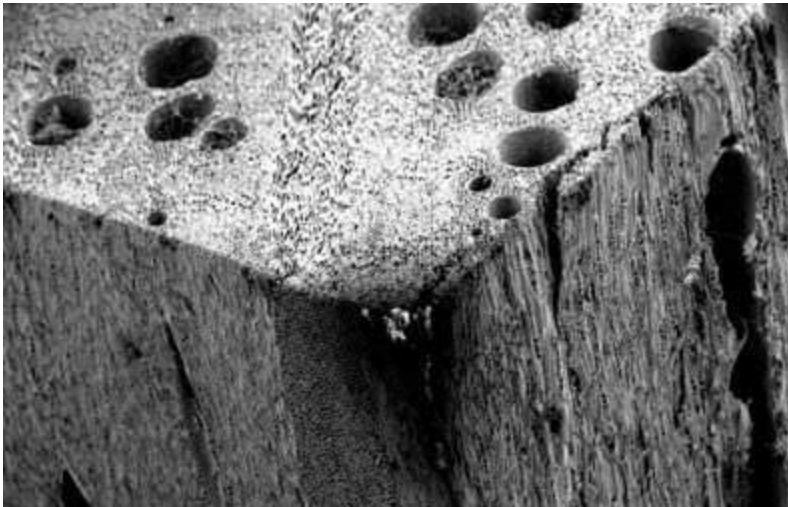


Physical Properties



- Hardwood trees
 - More dense
 - Pores

- Softwood trees
 - Less dense
 - No pores



Physical Properties



- Hardwood trees
 - Prominent grain
 - Slow growing
 - 40-60 years

- Softwood trees
 - Light grain
 - Fast growing
 - 30-50 years



White Oak



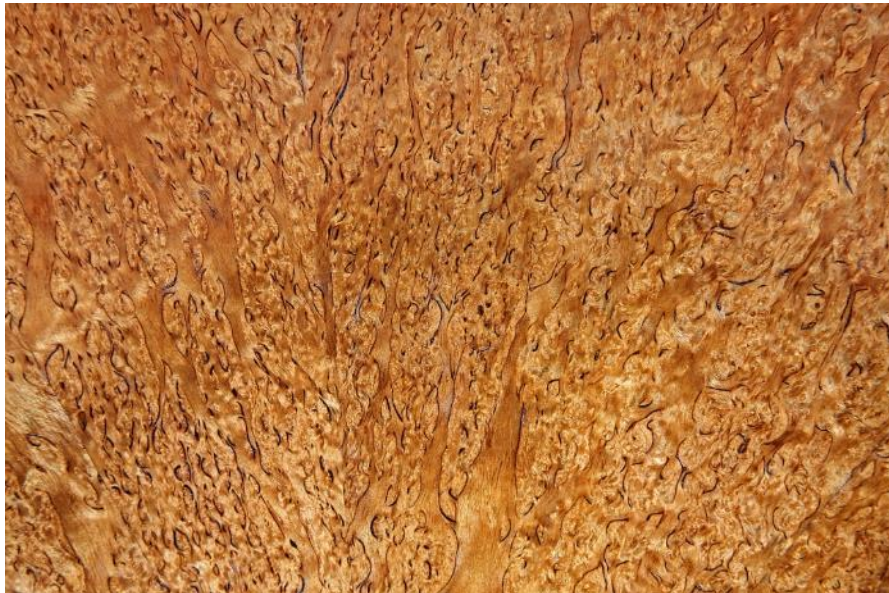
Douglas Fir

Physical Properties



- Hardwood trees
 - Not all hard
 - Balsa

- Softwood trees
 - Not all soft
 - Douglas fir



Physical Properties



Wood	Density (lb/ft ³)
Yew (Softwood)	42
Walnut (Hardwood)	40-43
Maple (Hardwood)	39-47
Hickory (Hardwood)	37-58
Oak (Hardwood)	37-56
Juniper (Softwood)	35
Douglas Fir (Softwood)	33
Mahogany (Hardwood)	31-53
Redwood (Softwood)	28-55
Spruce (Softwood)	25-44
Pine (Softwood)	22-35
Balsa (Hardwood)	7-9

Janka Ratings



- Force required to embed a .444-inch steel ball to half its diameter in a piece of solid wood
- Rates all solid wood species
- Northern red oak used as base value due to its prominence in the flooring industry

Walnut, Brazilian	3680
Teak, Brazilian	3540
Purpleheart	2890
Cherry, Brazilian (tatoba)	2820
Bubinga	2690
Gum, spotted	2473
Mesquite	2345
Mahogany, santos	2200
Gum, Sydney blue	2023
Merbau	1925
Jarrah	1910
Hickory/pecan	1820
Padouk	1725
Wenge	1630
Maple, Brazilian	1500
Sapele	1500
Maple, hard	1450
Cypress, Australian	1375
Oak, white	1360
Oak, Tasmanian	1350
Ash, white	1320
Beech	1300
Oak, Northern red	1290
Birch	1260
Iroko	1260
Pine, heart (antique)	1225
Teak, Thai/Burmese	1078
Walnut, American black	1010
Cherry, black	950
Pine, Southern yellow (longleaf)	870
Pine, Southern yellow (loblolly/shortleaf)	690
Douglas fir	660

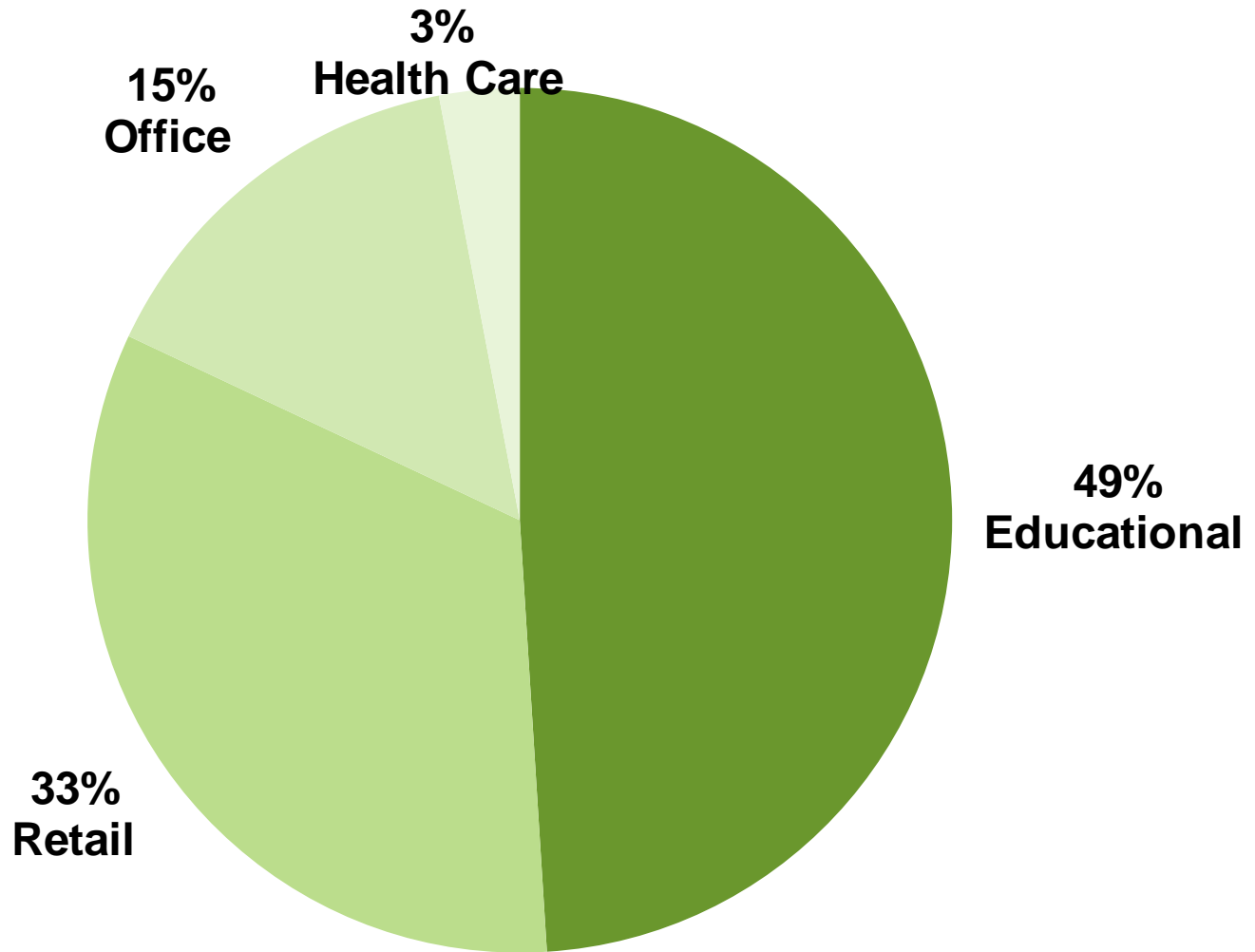
**Northern Red
Oak = 1290**



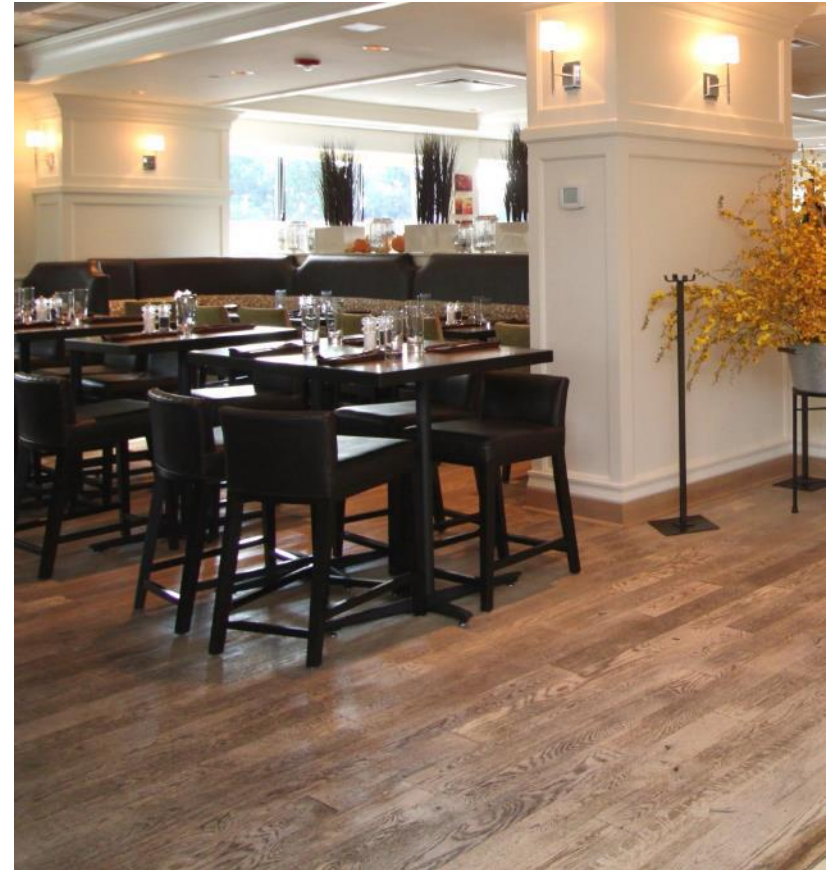
Wood in Commercial Settings



2015 Sales



Wood in Commercial Settings



Concrete Subfloors



- Cost-effective
- Fire resistance
- Energy efficient
- Sound control



Concrete Subfloors



- Cure minimum: 30 days
- Slab must be flat
- 1/8" within 6' radius
- 3/16" within 10' radius
- Grind high spots
- Fill low spots
- Self-leveling compounds



Wood in Commercial Settings



- Concrete subfloors
 - Moisture testing
 - Relative humidity
 - Calcium chloride
 - Vapor retarders

Concrete Subfloors



- Concrete foundation
 - 3 pints/cubic foot



- Concrete slab
 - 2 pints/square foot



Concrete Subfloors



- Glue-down installation
- Many adhesives include vapor retarders
- Additional moisture protection
- Excellent long-term performance



Dimensional Stability



Performance



- Wood is hygroscopic
- Absorbs, loses moisture depending on environment
- Swells = moisture gain
- Shrinks = moisture loss
- Direction of movement based on growth rings



Dimensional Stability



- Excess moisture = swell
- Result = cupping
- Raised edges/low center
- Multiple moisture sources
- Consistent temperature, humidity minimize occurrence



Dimensional Stability



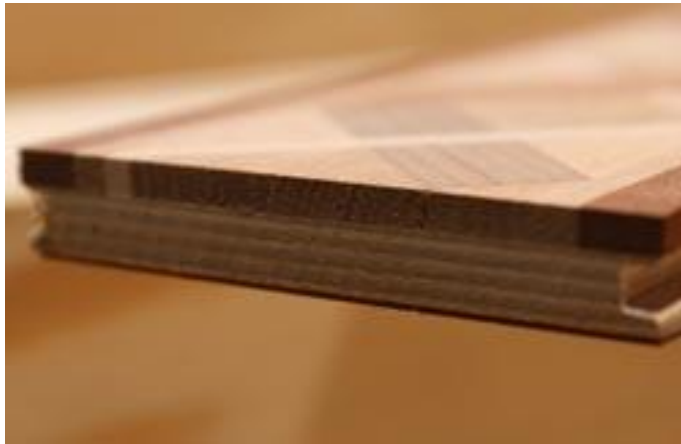
- Minimal moisture = shrink
- Result = gaps
- Space between floor boards
- Normal = seasonal
- Abnormal = non-seasonal
- Consistent temperature, humidity minimize occurrence



Types of Hardwood Floors



- Solid
 - Solid wood top to bottom



- Engineered
 - Several layers of wood veneer/slats bonded together with an adhesive

MDF



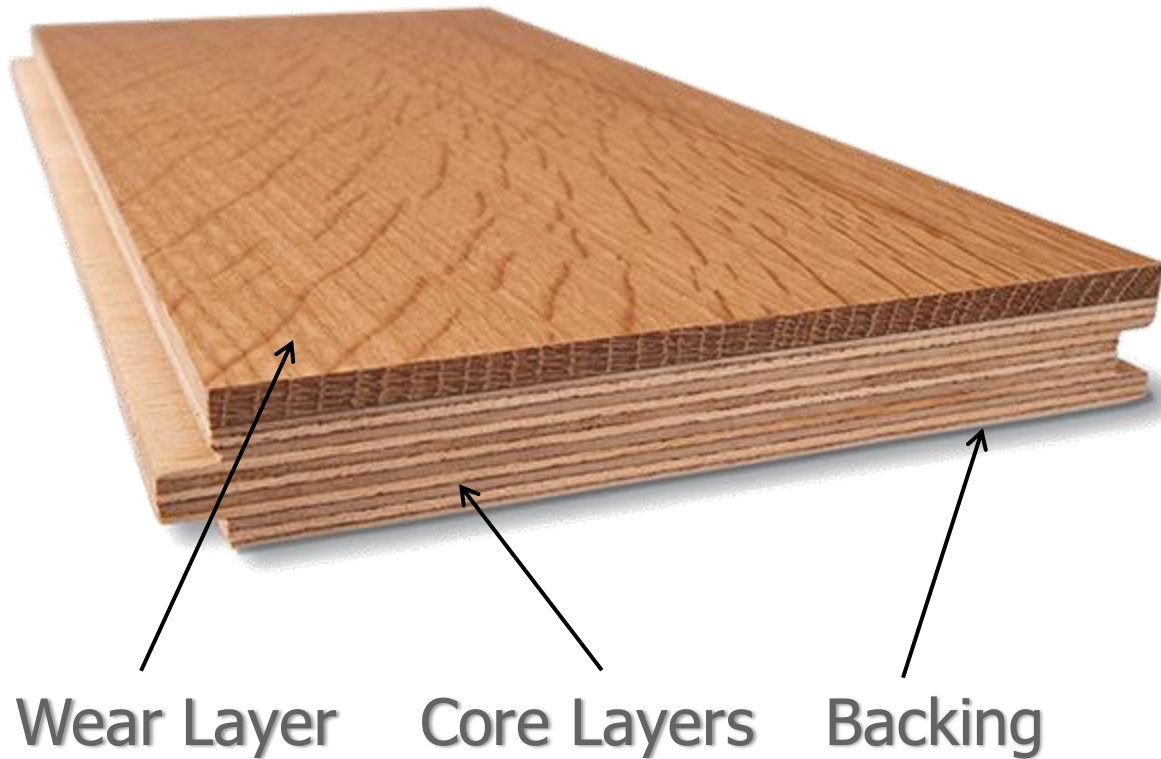
- Hardwood, softwood fibers
- Wax, resin binder
- Compressed
- Dense, strong

HDF



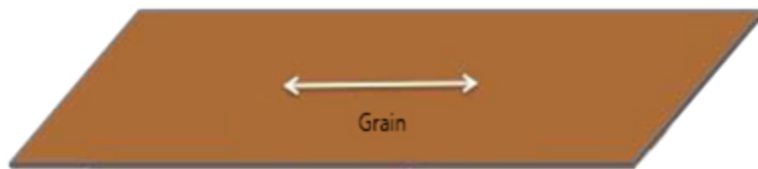
- Hardwood, softwood exploded fibers
- Wax, resin binder
- Highly compressed
- Dense, strong, hard

Engineered Construction



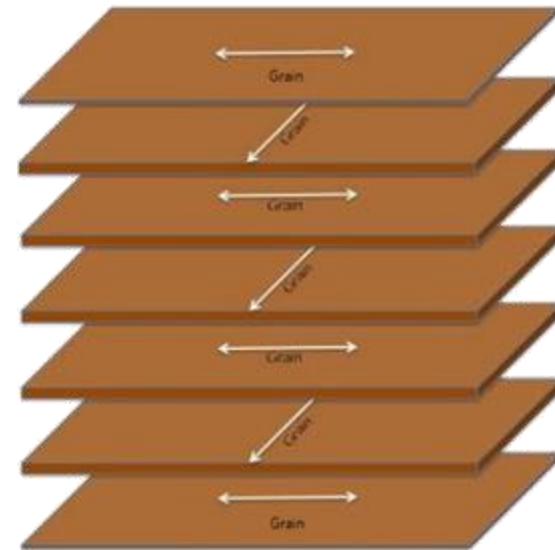
- Top layer = wear layer
 - 3-11+ layers
 - 3/8"-3/4" thick
- Wear layer is species selected
- Lower layers = core, backing
- Core, backing layers can be same species as wear layer, different species

Solid



- Grain = one direction
- Less dimensionally stable

Engineered

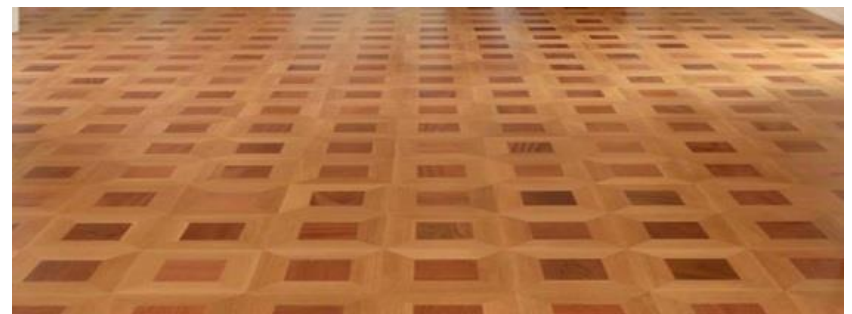


- Grain = multiple directions
- More dimensionally stable

Strip, Plank & Parquet



- Strip
 - Linear
 - Narrow
 - $> 3''$
- Plank
 - Linear
 - Wide
 - $\leq 3''$
- Parquet
 - Nonlinear
 - Geometric
 - Shape, size varies



Dimensional Stability



- Strip
 - Relatively stable
- Planks
 - Less stable
- Parquet
 - Relatively stable

Dimensional Stability



- Plainsawn
 - Variety of widths
 - Growth rings 0-45°
- Riftsawn
 - Narrow widths
 - Growth rings 30-60°
- Quartersawn
 - Narrow widths
 - Growth rings 45-90°
- Livesawn
 - Wide widths
 - Growth rings 0-90°





Plainsawn



- Expands, contracts through width
- Less dimensionally stable

Quartersawn



- Expands, contracts through thickness
- More dimensionally stable

Riftsawn



- Expands, contracts through thickness
- More dimensionally stable

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Maintenance



- Most neglected aspect of specifying hardwood floors
- Essential component of the specification process
- Maximizes lifetime of product
- Minimizes inconvenience of costly renovation
- Protects client's investment
- Promotes long-term sustainability of raw materials

Routine Maintenance

- Sweep, dust mop
- Vacuum with beater bar off to remove dirt, grit between floor boards
- Avoid water, steam mops which can damage finish, wood



Preventive Maintenance

- Place breathable throw-rugs at entrances
- Put felt pads on furniture in contact with floor
- Avoid walking on floor with sport cleats, high heels in disrepair



Preventive Maintenance



- Elephant = 50-100 PSI
- 125-pound woman in high heels = 2,000 PSI
- An exposed high heel nail head = 8,000 PSI



Preventive Maintenance



- Clean spills immediately with damp cloth
- Allowing liquids to sit damages finish, wood

Preventive Maintenance

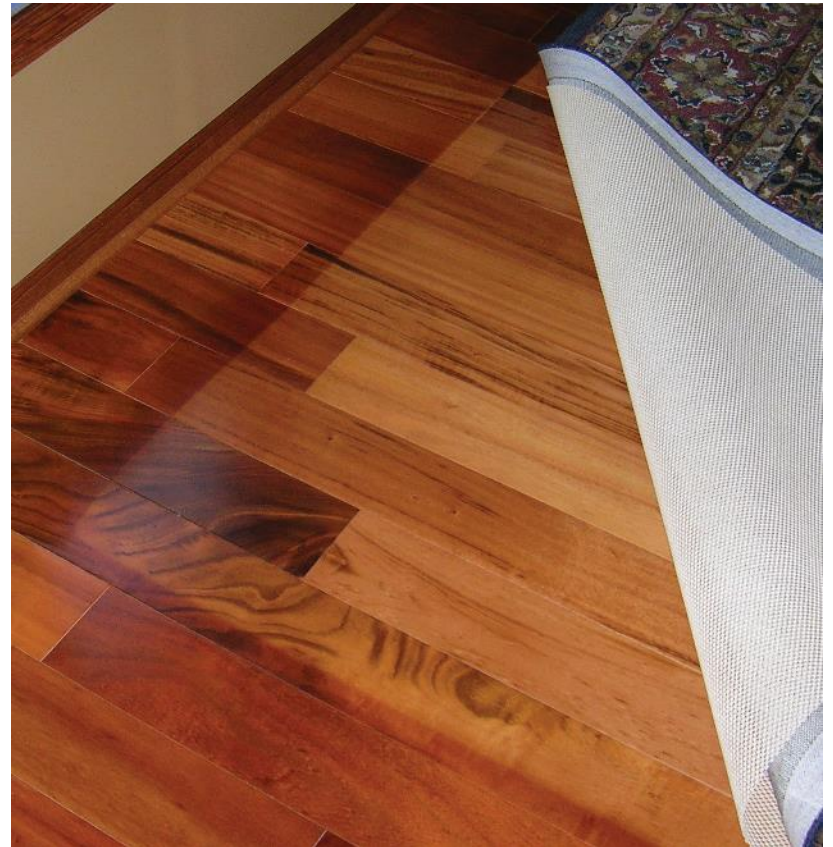


- Clean pet stains immediately
- Urine stains floor when left untreated
- Repair often requires board replacement
- Damage may reach subfloor, requiring replacement

Preventive Maintenance



- Sunlight affects wood floors like skin
- Oxidation, UV exposure
- Periodically move furniture, rugs to minimize exposure



Preventive Maintenance



- Never use household dust cleaners on wood floors
- Use manufacturer recommended cleaner for floor's
- If unsure, wood flooring professional can identify



Long-Term Maintenance



- Maintenance coat
 - Restores luster
 - Repairs small surface finish scratches
 - Lightly abrade surface finish
 - Apply new finish
 - Similar to repainting furniture
- Sand & refinish
 - Repair large scratches, dents
 - Repair exposed wood
 - Sand off finish, some wood
 - 1/32" wood removed
 - Apply new finish



Maintenance



- Restores beauty
- Will last decades
- Delivers enjoyment, value
- Extends service life



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Summary



- Both hardwoods, softwoods are used to make wood flooring
- Not all hardwoods are hard, not all softwoods are soft
- Commercial wood floors typically installed on concrete subfloors
- Dimensional stability of wood floors influenced by moisture, format, style, saw cut
- Wood floors should not be cleaned using water

Thank You

The logo for the Northwest Florida Area (nwfa) is located in the top right corner. It consists of the lowercase letters 'nwfa' in a white, sans-serif font, with a small green leaf icon integrated into the letter 'a'. The background of the top right corner of the slide features a photograph of a young child sitting on a couch and reading a book.

This concludes this course for:

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A photograph of a bedroom interior. The floor is made of dark wood planks arranged in a herringbone pattern. On the left, a bed with a white and grey plaid sheet is visible. In the background, there is a dark nightstand with a lamp and a white curtain. The text "Questions?" is overlaid in white on the floor.

Questions?