Lesson #4: Building Codes Past to Present (3 Days)

Objectives

Students will be able to…

- Trace the history of building codes.
- Describe the ICC, IBC, IRC, and CBC.
- Identify the three dominant model codes of the past century.

Common Core Standards

LS 11-12.6
RSIT 11-12.2
RLST 11-12.2
Problem Solving/Critical Thinking 5.4
Health and Safety 6.2, 6.3, 6.4, 6.5, 6.6, 6.12
Technical Knowledge and Skills 10.1, 10.2, 10.3
Residential and Commercial Construction Pathway D2.1, D2.8, D2.9, D3.1, D3.2, D3.3, D3.4, D3.7
Responsibility and Leadership 7.4, 9.3

Materials

PowerPoint Introduction to Building Codes Past to Present
https://documentcloud.adobe.com/link/track?uri=urn%3Aaaid%3Ascds%3AUS%3Ad6b906ac-9f45-43ae-9547-ac37035d7322
Mapping Main Ideas Worksheet
Evolution of Building Codes Handout and Graphic Organizer
Building Codes and Building History Test

Lesson Sequence

- Review the ***PowerPoint Introduction to Building Codes Past to Present*** presentation with the class. Have students take notes on the ***Mapping Main Ideas Worksheet.*** Students should identify main ideas and then support main ideas with facts. (50 minutes)

- Pass out the evolution of building codes handout and graphic organizer. Have students read the evolution of building codes hand out and fill in graphic organizer with a partner.
- Review graphic organizer as class. (50 minutes)
- Answer any questions about building codes and building history. Then pass out the ***Building Codes and Building History Test.*** (50 minutes)

Assessment
Informal assessment through questioning and checking for understanding Building codes and building history test

Accommodations/Modifications
Check for Understanding Highlighted Material Selective Partners One on One Support Extra Time If Needed

Mapping Main Ideas Worksheet

While reviewing the PowerPoint "Introduction to building codes past to present" decide upon 6 main ideas (topic sentences) and 3 sentences that clarify the main idea you chose.

Topic- Ancient Building Codes

Main Idea #1	supporting examples
Main Idea #2	supporting examples
Main Idea #3	supporting examples

Sum up what you read in 2 sentences; what are the most important points that were made about the evolution of Building Codes.

Conclusion

Main Idea #4

supporting examples

Main Idea #5

supporting examples

Main Idea #6

supporting examples

Evolution of Building Codes Handout and Graphic Organizer

The underlying principle of any building code is to protect the health, safety, and general welfare of the public in the construction and use of buildings and other structures. To this end, building codes establish the minimum standards that structures, and the materials used to construct them must meet. 'Minimum' is the operative word when discussing code requirements. This is because minimums ensure that enough has been done to ensure that the bridge won't collapse, or your electrical system won't electrocute you, etc. This is important in the construction industry because you can exceed the minimum, (within reason) but you are never allowed to fall short of the minimum. What you build must "meet code," i.e., meet the minimum requirements for safety.

In order to protect the safety and welfare of the general public, building codes address all facets of constructing a structure. From Framing to fire protection, concrete to roofing, plumbing, electrical, mechanical, etc., it is all addressed in the code.

It is also important to remember that while codes help reduce the hazards faced by those who will use a given structure, no building code is perfect, and therefore cannot completely eliminate all potential hazards. However, effective codes in combination with sound design, engineering, and construction methods can virtually eliminate all reasonable risks posed by any structure to those who use them.

- Around 1905 one of the first real building codes would be developed (up to this point, the country ran on local [municipal] codes). It was developed/published by the Fire Underwriters Association (made up of insurance companies), the "National Building Code" as it was called, focused on protecting the building rather the people occupying the building! It wouldn't be until the late 1920's before building codes were developed that focused on the safety of a building's occupants rather than the building itself.
- In 1915, code officials from all over the country met to discuss the problems and concerns that they shared. Immediately following these meetings, the first of three-model code writing organizations was formed.
- It was known as BOCA or Building Officials and Code Administrators International. (The *BOCA* National Building Code, or NBC) Created in 1915, BOCA represented code officials from the East and Mid-Western portions of the United States.
- In 1922, the second organization was formed. It was known as the Pacific Coast Building Officials Conference. This group permanently changed their name to the International Conference of Building Officials, or ICBO, upon the publication of their first code in 1927. (became known as Uniform Building Code or UBC) This organization represented code officials from the western states. Among these states was California.

- The Southern Building Code Congress International (SBCCI) was formed during 1940-41; this group first published its Southern Standard Building Code in 1946. In 1973 the name of the code was changed to the shorter Standard Building Code (SBC). The SBCCI represented code officials from the southern states.
- In 1994, BOCA, ICBO, and SBCCI agreed to work together to form the International Code Congress (ICC).
- The codes developed by the ICC are known as the International, or I-Codes. There are 14 different codes published by the ICC, covering all facets of building various structures. From framing to fire protection, houses to HVAC, bridges to balusters, and everything in between, it is all addressed in the I-Codes.

Who can submit new codes, or make changes/revisions to the code?

Anyone can submit a new code or addendum.

If you reason that there should be code to address some aspect of the construction process that currently is not included in the code, or there is a code already in place, but you don't feel it goes far enough to properly ensure the public's safety, you can submit to have that code added to, or changed.

If your concerns and/or data are considered valid, the new code will be added, or the existing code changed.

Since codes are published in three-year cycles, it will be three years from the latest published version of the code to which you are submitting for change before your addition or revision is added to the published code. In the meantime, your addition or revision will be issued as a "supplement" to the code. The process of adding to, and/or revising the code was highly evident in the aftermath of the1994 Northridge earthquake.

Engineers, architects, builders, etc. analyzed the bridges, freeways, homes, and other structures that were either damaged or destroyed by the quake. Their analyses and subsequent recommendations were submitted to the ICBO, with many becoming "supplements" to the 1994 Uniform Building Code. In 1997, these supplements became part of the published code with the last publication of the UBC. These codes can now be found throughout the current (2006) publication of the International Building Company.

BUILDING INDUSTRY TECHNOLOGY ACADEMY
A program promoted by the California Homebuilding Foundation

Unit Two: History of Architecture and Building Codes

Evolution of Building Regulations

Refer to the reading handout and use the Word Bank to fill in the organizer below.

Word Bank

BOCA Building Officials and Code Administrators - East Coast and Midwest specific

ICBO International Conference of Building Officials - West Coast specific

SBCCI Southern Building Code Conference International - Southeast specific

NBC National Building Code

Local Building Codes

State Building Codes

County Building Codes

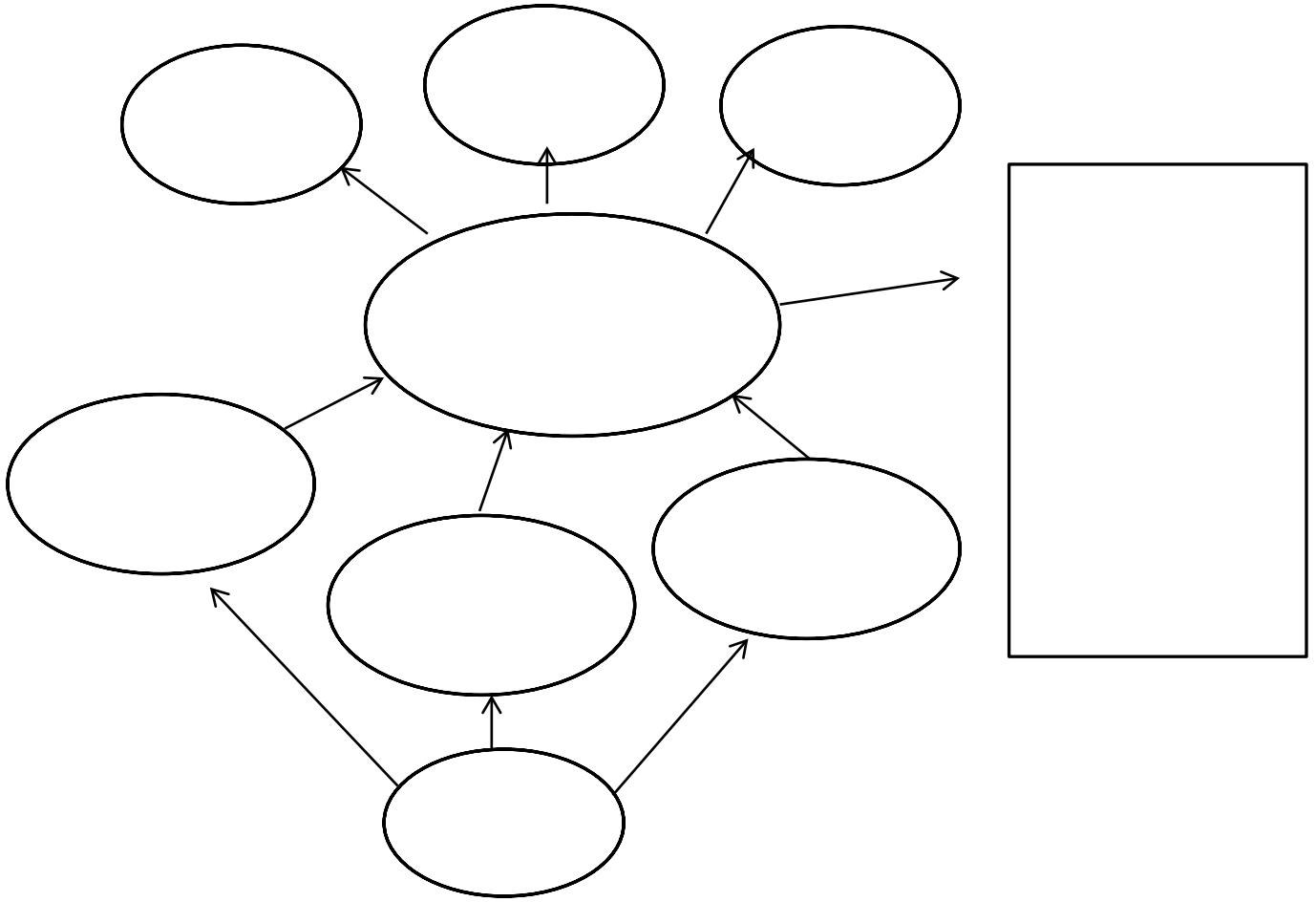
IBC International Building Code family

IFC International Fire Code

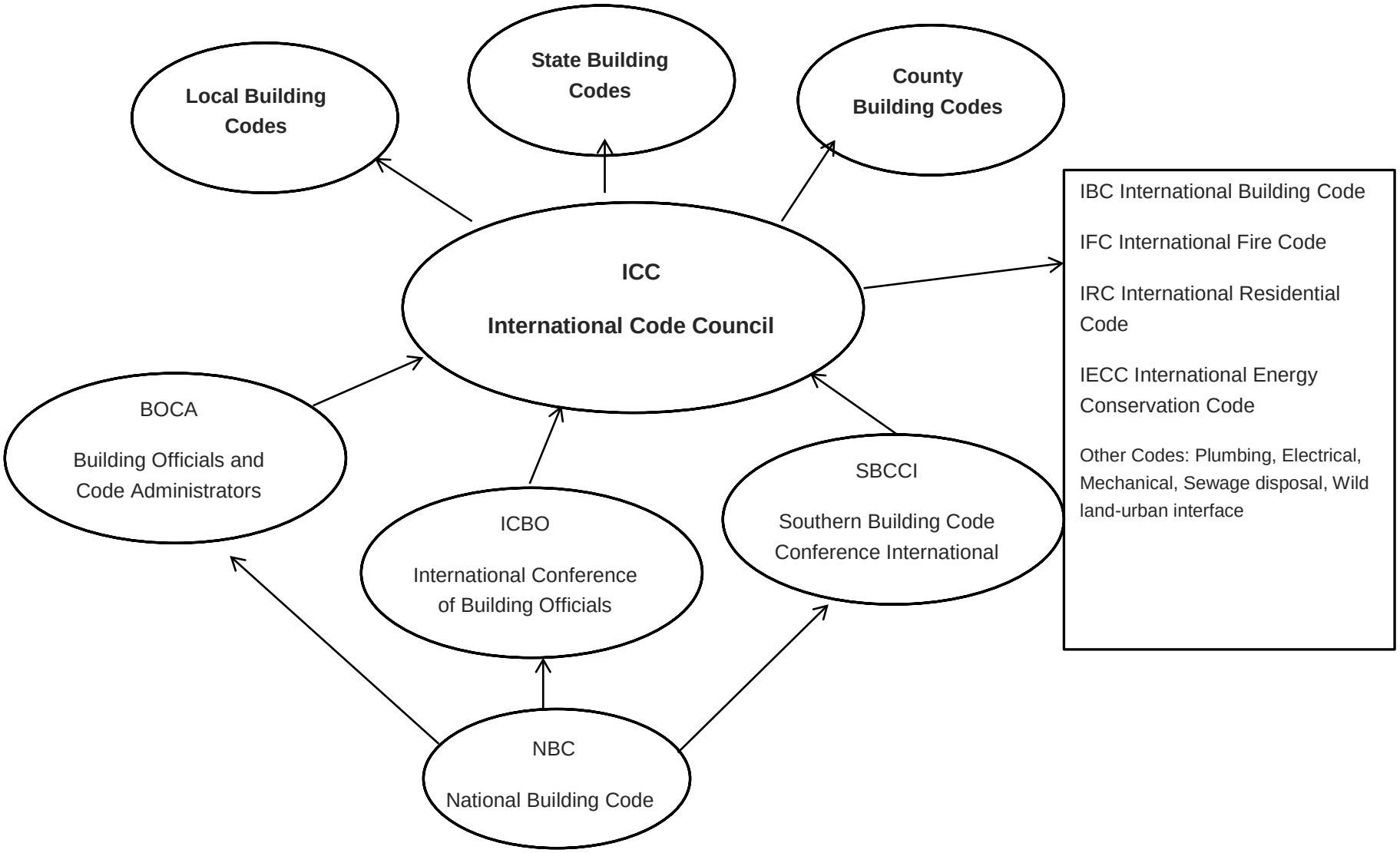
IRC International Residential Code

IECC International Energy Conservation Code

Other Codes: Plumbing, Electrical, Mechanical, Sewage disposal, Wild land-urban interface



Evolution of Building Regulations – *Answer Key*



Building Codes and Building History Test

Directions: Circle the letter of the correct answer.

1. Simply put, a building code is...
    a. Only available to those who pay.
    b. A series of numbers that represent verbal instructions.
    c. A set of rules that makes sure a structure is built correctly.
    d. An optional set of rules ensuring structural integrity.

2. What are the three building codes that we use in the United States?
    a. Residential, Commercial, Industrial
    b. National, Model, Municipal
    c. Literal, Figurative, Probable
    d. Primitive, Modern, Futuristic

3. The purpose of any building code is
    a. For the insurance company so the basis of my claims can be approved
    b. Tell me how to build, so I know short cuts
    c. Peace, safety, and punishment
    d. Health, safety, and general welfare of the public

4. What were the first most commonly used structures?
    a. glass house
    b. concrete walls
    c. straw hut
    d. caves

5. Industrial grade construction was first introduced by the use of:
    a. mud brick
    b. electrical
    c. fire
    d. sunlight

6. Who lived in the pyramids?
    a. Pharoah
    b. It was not for living, they were tombs.
    c. Servants
    d. The family of the Pharaoh

7. What is tensile strength?
    a. How easily it can wrap a Christmas tree.
    b. A structures temperature cap,
    c. A human's ability to lift heavy weight
    d. An objects ability to resist pulling, bending, stretching or twisting forces.

8. The Romans invented a material that is indispensable to the construction process. What is it?
    a. Adobe
    b. Hydraulic concrete
    c. Cat 5
    d. Gasoline

9. The Parthenon is made of post and lintel construction. What was the name of another structure that was made of post and lintel construction?
    a. Pyramids
    b. Mud Brick huts
    c. Stonehenge
    d. The Titanic

10. Three modern United States structures that were influenced by Greek architecture are:
    a. The U.S. Mint in San Francisco, 2nd Bank of the U.S., U.S. Supreme Court
    b. Bank of England, British Museum, Paris Opera House
    c. The Leaning Tower of Pisa, Luxor Casing, Louvre Pyramid
    d. SIS Building, The Chet Holifield Federal Building in Laguna Niguel, MGM Grand Hotel

11. With our new technologies should building codes be proactive and change before a catastrophe hit?

    Answer on a separate sheet of paper. You must have at least 5 sentences: Main idea (thesis statement), 2 support details of your stand, and a concluding sentence. You will also be graded on Grammar and Mechanics- 16 total points.

Building Codes and Building History Test – *Answer Key*

Directions: Circle the letter of the correct answer.

1. Simply put, a building code is...
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Grading Rubric

	4 Points	3 Points	2 Points	1 Point
Thesis (Main Idea)	Correctly identifies the main idea in a clear and accurate manner.	Correctly identifies most of main idea in a complete sentence.	Identifies an important idea but not the main idea in a complete sentence.	Identifies a detail but not the main idea.
Supporting Details	Clearly states 2 or more important details using own words or statements.	States at least 2 important details with some paraphrasing of information.	States at least 1 important detail. Demonstrates little if any paraphrasing.	Includes unnecessary details. Does not demonstrate any paraphrasing.
Conclusion	Writes a clear and specific concluding statement.	Writes an adequate concluding statement.	Writes a weak concluding statement.	Does not include a concluding statement.
Mechanics and Grammar	Contains few, if any spelling or grammatical errors.	Contains several errors in punctuation, spelling or grammar that do not interfere with meaning.	Contains many errors in punctuation, spelling and/or grammar that interfere with meaning.	Contains many errors in punctuation, spelling and/or grammar that make the piece illegible.