

# Inductive Learning in the Classroom

Inductive Learning helps students see the connections among pieces of critical information and to conceptualize, on their own terms, the broader perspective into which these pieces fit. In using Inductive Learning to lead students to the big picture, it is important to remember that the strategy follows a prescribed sequence designed to maximize the benefits of induction. Explain these phases to students before the lesson so that they understand what roles they will be playing over the course of the lesson. Additionally, in explaining the phases and then letting students experience them, you initiate the process of internalization. This way, you allow students to see that the strategy is not simply an instructional tool; it is also a thinking structure they can apply in other situations and other contexts, whether they be academic, vocational, or personal.

## The Five Phases of Inductive Learning

The Inductive Learning Strategy moves through five essential phases. They describe how the **student**—not the teacher—experiences them.

### PHASE I: EXAMINE DATA

- Examine the data
- Define unfamiliar terms

### PHASE II: GROUP AND LABEL DATA

- Group data with common attributes
- Give descriptive labels to groups

### PHASE III: INTERPRET INFORMATION

- Identify critical relationships
- Explore cause/effect relationships
- Make generalizations, predictions, etc.
- Support generalizations and predictions

### PHASE IV: SYNTHESIZE

- Apply learning to a new and different context to demonstrate understanding

### PHASE V: EVALUATE THE LESSON

- Evaluate and reflect on knowledge of content
- Evaluate and reflect on learning process

# A Model Lesson

To understand how Inductive Learning plays out in the classroom, here is a model lesson for your analysis. You will be looking at organizers and other content that the teacher uses. The model lesson also includes sample student work and an internal monologue in which the student might be engaging as she works through the lesson.

## Phase I: Examine the Data

**What is happening:** In this phase, students are introduced to the lesson and provided with a bank of words related to colonial New England. Students must examine the words, look up any words they do not know, and begin to look for connections and relationships between the words.

### What was life like in New England?

Imagine that you've invented a kind of time machine that allows you to hear sounds and see some images from the past. You tune the device to one of the original American colonies in New England around 1750. Below is a list of some of the words you would hear and some of the things you would see as your device scanned the colony. Look these words over and read the directions on the next page.

|            |              |           |
|------------|--------------|-----------|
| apprentice | Sabbath      | devil     |
| furniture  | candles      | leather   |
| pelt       | hogs         | squash    |
| axe        | saw          | faith     |
| gentry     | claims       | linen     |
| petticoat  | homemade     | tan       |
| baptize    | servant      | fall      |
| goodwife   | congregation | lobster   |
| pillory    | house        | taxes     |
| barrel     | shift        | fireplace |
| governor   | community    | master    |
| pine       | import       | town      |
| Bible      | sin          | meeting   |
| harvest    | cooper       | folklore  |
| pray       | journeyman   | oak       |
| beggar     | slave        | trap      |
| herdsman   | corn         | freeman   |
| providence | keg          | oil lamps |
| breeches   | spinning     | whipping  |
| hoe        | wheel        |           |

**What the student might be thinking:**  
*Hmmm, as I look over the words, I see that I know what most of them mean, but I don't know a few, such as "freeman" and "pillory." I'm going to look them up. I also notice that some words seem to have things in common, like "hoe," "axe," and "saw."*

## Phase II: Group and Label the Data

**What is happening:** Phase II engages students in the Inductive Learning process by asking them to develop appropriate groupings for the data. Students are encouraged to think flexibly as they create their groups so that they may discover several critical relationships in the process. They may change their groups as they see fit, and they may place words in more than one group. When they have made their groups, students must develop a descriptive label for each grouping. This process of categorizing and labeling information allows students to develop a deep, personal understanding of the content.

What was life like in New England?

These words and images are clues to what life was like in colonial New England. You don't have a great deal of information, but you can begin to get a picture of colonial life. With a partner, look at the words and attempt to put them into groups according to some common feature. Rewrite the words in the spaces provided below and label the spaces with the common feature you identified. All words must be placed in a grouping. Words can appear in more than one grouping. You do not have to use all of the spaces provided.

|   |   |   |
|---|---|---|
| <div style="border: 1px solid black; border-radius: 50%; padding: 10px; width: 150px; margin: 0 auto;">           baptize<br/>Bible<br/>congregation<br/>providence<br/>Sabbath<br/>folklore<br/>pray<br/>sin<br/>devil<br/>faith         </div> <p><u>religion</u></p> | <div style="border: 1px solid black; border-radius: 50%; padding: 10px; width: 150px; margin: 0 auto;">           candles<br/>goodwife<br/>homemade<br/>furniture spinning wheel<br/>fire place<br/>oil lamps<br/>petticoat<br/>breeches<br/>shift<br/>house         </div> <p><u>home life</u></p> | <div style="border: 1px solid black; border-radius: 50%; padding: 10px; width: 150px; margin: 0 auto;">           herdsman<br/>journeyman<br/>governor<br/>servant<br/>apprentice<br/>freeman<br/>cooper<br/>axe<br/>hoe<br/>saw         </div> <p><u>occupations and tools</u></p> |
| <div style="border: 1px solid black; border-radius: 50%; padding: 10px; width: 150px; margin: 0 auto;">           claims<br/>community<br/>governor<br/>taxes<br/>town meeting<br/>pillory<br/>whipping         </div> <p><u>government and laws</u></p>                | <div style="border: 1px solid black; border-radius: 50%; padding: 10px; width: 150px; margin: 0 auto;">           fall<br/>harvest<br/>hoe<br/>corn<br/>master/slave<br/>sheep<br/>hogs<br/>pine<br/>oak         </div> <p><u>climate and farming</u></p>   | <div style="border: 1px solid black; border-radius: 50%; padding: 10px; width: 150px; margin: 0 auto;">           barrel<br/>import<br/>leather (tan)<br/>linen<br/>taxes<br/>pelt<br/>trap         </div> <p><u>economy</u></p>  |

### What the student might be thinking:

*After I look over this list, I'm a bit overwhelmed with the number of words, so I'm going to begin by placing one word by itself, "apprentice." Now, as I look at the next word, "axe," I don't think it relates too well to apprentice, although it might be a tool that an apprentice might use. So, for now, I'm going to make it a second category. "Baptize" is next, and I am going to make it a third category. "Barrel" seems to be an object like an axe, so for now, I'm going to group them together. The next term, "Bible," seems to go with "baptize", things that are connected with churches. I'm going to look down the list and see if there are any other words about churches. Here are "congregation," "providence," "Sabbath," "folklore," "pray," "sin," "devil," and "faith." I'm going to add them to the group.*

*Okay, now for a label. I could use church. It seems a little too specific, though. All these things relate to religion, so I think for now, I'll call that group religion.*

## Phase III: Interpret Information

**What is happening:** In this phase, students are asked to apply what they have learned inductively by using their groupings to develop three hypotheses about colonial New England. The goal of this stage is to encourage students to complete the process of induction by asking them to extract generalized information from the specific details they began with.

What was life like in New England?

Discuss the groupings you made with your partner. Based on your groupings, draw three conclusions about life in the colonial period. Consider three hypotheses about this period of time. Write these hypotheses in the boxes below.

Now we'll see if you can verify your hypotheses. Read the passage about colonial New England. Anytime you come across evidence that supports or refutes a hypothesis, write the number of the line and a few key words in the correct box.

| Hypothesis   | Support  | Refute  |
|--|--|---|
| <p>①</p> <p>Religion played a major role in colonial New England life.</p> | <p>48 "Religion strongly influenced the social and political life of New England."<br/>53 "Rules of the church generally became laws of the colony."</p> |   |
| <p>②</p> <p>Trade was an important part of the economy.</p>                |  | <p>It seems that most New England homes were self-sufficient.<br/>39 "Most New Englanders had small farms."</p> |
| <p>③</p> <p>Much of New England life centered around farming.</p>          | <p>39 "Most New Englanders had small farms."<br/>39-46 "corn, cattle, hogs, sheep, chickens, fruit, vegetables."</p>                                     |   |

**What the student might be thinking:**

*Great! Now I've got six labeled categories. If I look at the group I call "religion" I see a lot of terms that say this must have been a big part of peoples' lives. It kind of looks like the church had a big presence. I mean, you got baptized, you prayed, you read the Bible, you were taught about evil.*

*So, I'm going to use that category for one of my hypotheses. I'm going to hypothesize that "religion played a major role in colonial New England life."*

*Now that I've read the passage I need to find evidence that supports my hypothesis. I notice that the text says that religion thoroughly influenced the social and political life of New England. It also says that rules of the church generally became laws of the colony. These facts seem to support what I'm saying.*

Phase three also includes a critical reading that students use to support or refute their hypotheses. Thus, the strategy asks students to make generalizations and, just as importantly, to gather evidence in support of their generalizations.

## What was life like in New England? Reading: Colonial New England



When people first began colonizing New England, they copied the Old World in their everyday life. They acted as if they were an extension of England. They thought, spoke, dressed, and retained the customs of Europe. The set up of their society was like Europe with several classes of people. At the top of the social structure was the “gentry” made up of wealthy merchants, planters, lawyers and doctors. Under the gentry were the men who owned property but were not wealthy. They included farmers, shopkeepers, and craftsmen. The bottom level consisted of poor, unskilled laborers who were generally slaves or contracted servants. The difference between the social structure in the colonies and in England was that it was much more flexible. In the colonies, it was possible to be a member of a lower class and rise to a higher class (except for slaves). England controlled the government of the colonies. Each one had a governor appointed by the king. The members of the legislative houses were either elected or appointed. Local governments were in charge of law enforcement, charging and collecting taxes, and repairing the roads. The death penalty was customary for crimes of armed robbery, counterfeiting, murder, and treason. Drunkenness, slander, swearing, theft, and breaking the Sabbath were considered minor offenses. The punishments for these crimes included a public whipping, public humiliation by placing the person in the pillory or stocks, or the ducking stool.

The lifestyle of the New England colonies also developed from the old European ways. The households were large and generally included resident in-laws. All members of the family were the responsibility of the father. He made all important decisions. The first houses were built similar to those in Europe, but were later changed to adapt to local weather conditions and available materials. The life of the house centered around the fireplace. It provided the heat and light essential for everyday living. Much of the detail and design of one’s home as well as the lifestyle depended on one’s individual wealth. The wealthy imported fine furniture from Europe, but most settlers had homemade items along with a few they were able to bring from Europe. The homemade furniture was plain and sturdy. Blocks of wood, barrels, or benches served as chairs. They used oil lamps and candles for lighting. Tinderboxes, bed warmers, iron pots, and spinning wheels were generally considered necessities.

Clothing varied according to wealth and occupation. The wealthy imported clothes or had them tailored to resemble



## What was life like in New England?

current European styles. On farms, workingmen wore breeches and long shirts made from linen and woven by the women of the household. Male servants who worked in the field likely wore only breeches. In cold weather the men wore a loose fitting overcoat, leather leggings, mittens, and a wool cap. Women wore dresses, a petticoat, and a single undergarment called a “shift.”



Most New Englanders had small farms located near villages or small towns. They raised cattle, hogs, sheep, chicken, fruit, and vegetables. They also hunted and fished for deer, clams, lobsters, squirrels, and other game in the local woods, rivers, and oceans. Corn became one of the basic foods in most households. Cornmeal was made into various ashcakes, hoecakes, and breads. Storing food for the winter was a problem as they had not developed canning or techniques for refrigeration. Meats were smoked, salted, and dried. They dug cellars to keep roots, fruit, and vegetables, but the usual winter diet consisted of bread and meat.



Religion strongly influenced the social and political life of the New England colonies. Most colonists came to the colonies seeking religious freedom. Church officials did the work that governments do today. These included education, care of the poor, and record keeping of marriages, baptisms, and deaths. The churches were not just sites of worship. They were the places for community gatherings and town meetings. The rules of the church generally became the laws of the colony and were very strict. Many everyday activities like cooking, shaving, and other domestic activities were forbidden on Sunday. The colonists also believed in folklore as highlighted by the Salem witchcraft trials.

The “kaleidoscope” turned and in time the New England colonies developed their own way of life as they adapted to the conditions in the New World. The men and women who had at one time viewed their colony as an extension of England, soon began to consider themselves Americans.

## Phase IV: Synthesize

**What is happening:** Now that the student has formulated hypotheses and evidence, the next phase asks for a synthesis of learning. One way to accomplish this is with the following assignment. The student chose one question to address and applied the standards of the rubric to complete it.

|  |   |
|--|---|
| <p><b>Directions:</b> <i>Read each question. Choose one assignment. Read through the rubric on which you will be assessed. In your paper, provide at least three generalizations and data that support them. Compare your completed product to the rubric before you turn it in.</i></p> |   |
| <p><b>Describe life in a New England town in the 1750s.</b></p>  | <p><b>Write a letter to England from someone living in New England in the 1750s.</b></p>  |
| <p><b>Compare and contrast three aspects of life in New England with life in your town today.</b></p>  | <p><b>How was life in New England like a _____? Create a metaphor and support it.</b></p> |

| <b>Rubric for Life in New England Paper</b>   |   |  |
|---|---|--|
| <b>Content</b>  |   |  |
| <p><b>Needs Development</b></p> <p style="text-align: center;">1</p> <p>Concepts need to be better formed and content is inaccurate.</p>  | <p style="text-align: center;">2</p> <p style="text-align: center;">3</p> | <p style="text-align: right;"><b>Exemplary</b></p> <p style="text-align: right;">4</p> <p>Demonstrates at least three major concepts and the content is accurate.</p>  |
| <b>Critical Thinking</b>  |   |  |
| <p><b>Needs Development</b></p> <p style="text-align: center;">1</p> <p>Generalizations must be better supported with evidence from the text to show a greater depth of content knowledge.</p>  | <p style="text-align: center;">2</p> <p style="text-align: center;">3</p> | <p style="text-align: right;"><b>Exemplary</b></p> <p style="text-align: right;">4</p> <p>Includes sufficient evidence to support each generalization.</p>   |
| <b>Craftsmanship</b>  |   |  |
| <p><b>Needs Development</b></p> <p style="text-align: center;">1</p> <p>Writing must be less vague, language must spark greater interest, content needs to be engagingly presented, and closer attention must be paid to grammar and mechanics.</p> | <p style="text-align: center;">2</p> <p style="text-align: center;">3</p> | <p style="text-align: right;"><b>Exemplary</b></p> <p style="text-align: right;">4</p> <p>The writing is clear, coherent, concise, and clever. It makes use of appropriate grammar, construction, and mechanics.</p> |

**What the student might be thinking:** *Well, I've got four choices and the two that catch my attention are the compare and contrast piece and the letter. I like to look at differences and similarities, but I want to do something a little unusual, so I'll try my hand at the letter. I liked it when we read real letters from the colonists and talked about the way they used to write. I'm going to use those letters to try to sound like a real colonist.*

*As I look at the rubric, I see that I need to address three areas: Content, Critical Thinking, and Craftsmanship. I need to build a structure that includes three concepts and supporting details. I'll use two of my hypotheses that were already supported from the reading: religion and farming. I'm going to add one other category I had developed earlier: occupations and tools.*

*I think I'll pretend to be one of the people from New England. A farmer seems to work for me. This farmer wants to get rich and move up in society. I'll talk about the farm and add some information*

*about religion. When I finish, I need to do a big time "grammar check" since my teacher is such a stickler about this! Oh, and I have to remember to compare my paper to the rubric to make sure I covered all the requirements.*

## **Student Product: Life in New England Letter**

10 September 1751

My dearest Eliza,

I miss our children and you more than I can say, but please know that, God willing, the time will be soon when you may join me on our new farm in New England. Life here is abundant with possibilities and the richness of each day is only mitigated by your absence. Let me share some of what you have to look forward to when you come to this wondrous land.

Our second harvest is upon us, so we have well-established corn fields, along with a variety of fruits and vegetables to sustain us. The livestock are thriving. We have spun much wool into yarn in anticipation of receiving back from you your beautifully knitted caps and mittens. The next month will keep us busy with preparations for the winter—drying our food and smoking our meats.

Because of the good fortune the Lord bestowed upon us after our first harvest, I have put aside enough money to expand our land holdings. You know that my attempt is to further our status in the community so as to benefit each of you, and I have become acquainted with some of the wealthier planters, who seem open to including newcomers. This is so unlike jolly old England, yes?

I perhaps miss you most on Sundays when I sit in church and hear God's word. I am reminded of the sacrifices we each are making to serve the Lord, yet am thankful that we have the opportunity to do so as we see fit. Here in God's house, our leaders make the decisions about how we wish to live. We are blessed, indeed, to chart our paths.

Please bless little Anna, Rose, Kevin, and Catherine for me and give them the corn husk toys and dolls I have sent. Do make a woolen coat for yourself with the yarn I am enclosing. I love you.

**Assessing the Paper:** After the student assesses his/her own work, the teacher then uses the same rubric to check the student's assessment. Below is an example of some teacher comments:

*As I examine the letter written to England, I see that the student has a strong, general understanding of life in New England in the 1750's. The student presents at least three concepts—those about farming, societal organization, and religion. The information is accurate and supported with details. The writing is creative and the language engaging. The piece flows easily from one concept to the next and has a coherent voice throughout. The student has a command of the conventions of the language. This product would be considered a good example of the very high end*

# Phase V: Evaluate the Lesson

**What is Happening:** For the final phase, students use a rubric such as this one to evaluate their work and their participation in the lesson. Notice that the rubric is divided into three assessable dimensions: **content**, **process**, and **product**. Thus, the rubric not only asks students to assess their content knowledge and the quality of their products, but also the behaviors they exhibited during the lesson. In this way, students become deeply familiar with their part in the learning process: they are reminded that learning is an active—rather than a passive—process and that learning behaviors can be analyzed and refined.

## CRITERIA FOR EVALUATION

| KEY                  |
|----------------------|
| 4 exceptionally well |
| 3 very well          |
| 2 somewhat well      |
| 1 not very well      |

**Content:** How well does your work demonstrate an understanding of the important facts and concepts specific to the lesson?

**Specific points to look for:**

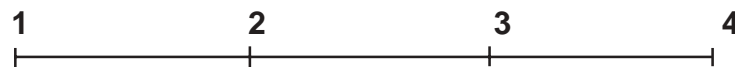
- Understanding of the importance of religion to the colonists.
- Understanding that colonial New England was an agrarian society.
- Understanding that there was a relatively rigid, hierarchical social structure in place.
- Understanding that life in colonial New England was difficult and required much hard work.



**Process:** How well did you convert data into meaningful/supported hypotheses?

**Specific behaviors I should have engaged in:**

- Collecting evidence: was appropriate evidence taken from the text?
- Forming groups: do they make sense?
- Devising labels: do the labels represent the groups clearly and accurately?
- Critical thinking: do the groups reflect flexible thinking and a multiplicity of ideas?
- Supporting hypotheses: did you provide adequate reasons to support your groups?



**Product:** How well does your product communicate what you know and understand?

**Specific points to look for:**

- Have you demonstrated that you understand the content?
- Was adequate and appropriate evidence collected and used?
- Were the hypotheses supported?
- Do the generalizations and predictions lead to any new insight?
- Is your work clear, coherent, concise, and clever? Does it make use of appropriate grammar, construction, and mechanics?

