Maximizing Language Development During Integrated ENL Classes (Grades 6-12)

April 24, 2017
8:30 AM - 2:30 PM

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Providence, RI
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NYU/Steinhardt
NYS Statewide Language RBE-RN at the
Metropolitan Center for Research and Equity
Agenda

- Create instructional profiles for your EL students to plan responsive language development for each ELL

- Analyze secondary science and social studies textbook chapters to identify language demands and language learning opportunities

- Tie instruction to city and state learning standards and to the bilingual progressions

- Plan to include appropriate supplemental materials for students who represent a range of proficiency and literacy levels

- Acquire strategies for actively engaging ELLs in language practice within integrated ENL/content area settings

- Discuss the use of the native language in integrated ENL Science and Social Studies classes

- Collaborate across ENL and content area partners during the workshop day in planning integrated ENL instruction that focuses on language learning and content area learning
It’s All About Instructional Planning and Delivery

Advance Language Proficiency

Learner-Centered Classrooms

Maximizing Language Development in an Integrated ENL Class

L, S, R, W
Understanding the Proficiency Profiles of your English Learners: *Creating Instructional Profiles for ELLs to Plan Responsive Language Development for Each ELL in Your Integrated Content Area Class*
<table>
<thead>
<tr>
<th>Gr</th>
<th>Last Name, First Name</th>
<th>ID Number</th>
<th>Listening</th>
<th>Speaking</th>
<th>Writing</th>
<th>Reading</th>
<th>Total Score*</th>
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<td>08</td>
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<td>14</td>
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</table>

1. Choose Grade 8 or 10.
2. Convert the Scores.
3. Create a **Profile of Performance** by listing best to worst skill (modality) areas (L, S, R, W)
4. Note the **Overall Level** of the Student (Entering, Emerging, etc.)
5. Note if they fall in the **low, mid or high range** of the level they are in.
6. Note if they are developing the 4 skills/modalities evenly or unevenly.
ATTACHMENT G
NYSESLAT 2016
SCALE SCORE RANGES FOR DETERMINING
ENGLISH LANGUAGE PROFICIENCY

To determine a student's overall proficiency level, find the student's
total scale score in the scale score ranges on this chart.

<table>
<thead>
<tr>
<th>Grade</th>
<th>Entering</th>
<th>Emerging</th>
<th>Transitioning</th>
<th>Expanding</th>
<th>Commanding</th>
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<td>213–244</td>
<td>245–263</td>
<td>264–315</td>
<td>316–360</td>
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<td>4</td>
<td>120–181</td>
<td>182–228</td>
<td>229–265</td>
<td>266–310</td>
<td>311–360</td>
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<td>7</td>
<td>120–169</td>
<td>170–212</td>
<td>213–249</td>
<td>250–299</td>
<td>300–360</td>
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<td>9</td>
<td>120–175</td>
<td>176–220</td>
<td>221–262</td>
<td>263–317</td>
<td>318–360</td>
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<td>10</td>
<td>120–175</td>
<td>176–220</td>
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<td>11</td>
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<td>120–178</td>
<td>179–220</td>
<td>221–262</td>
<td>263–317</td>
<td>318–360</td>
</tr>
</tbody>
</table>
**Potential Proficiency Bands**

<table>
<thead>
<tr>
<th>Scaled Scores</th>
<th>Proficiency Level</th>
</tr>
</thead>
<tbody>
<tr>
<td>30-42</td>
<td>Entering</td>
</tr>
<tr>
<td>43-54</td>
<td>Emerging</td>
</tr>
<tr>
<td>55-66</td>
<td>Transitioning</td>
</tr>
<tr>
<td>67-78</td>
<td>Expanding</td>
</tr>
<tr>
<td>79-90</td>
<td>Commanding</td>
</tr>
</tbody>
</table>

*These are not confirmed ranges; they are very rough estimates, just breaking the total point spread from 30-90 into regular intervals for the 5 proficiency levels—**USE WITH EXTREME CAUTION**!
Dear Parent/Guardian of Jane,

We are pleased to provide you this report about Jane's performance on the New York State English as a Second Language Achievement Test (NYSESLAT) that was administered in the spring of 2016 to all English Language Learners/Multilingual Learners (ELLs/MLLs). The scores from this test provide one way to understand student English Language development. However, these scores do not tell the whole story about what Jane knows and can do.

For more information about this test, the New York State standards, and how you can help Jane, go to: www.pt2.nysed.gov/biling/bilinged/parent-information/home.html

**JANE'S ENGLISH LANGUAGE PROFICIENCY LEVEL IS EMERGING**

**JANE'S TOTAL SCALE SCORE**
- **COMMANING**
  Has met the State standard to demonstrate proficiency and is now designated as a Former ELL/MLL entitled to receive two years of ELL/MLL services.
- **EXPANDING**
  As an ELL/MLL, shows great independence in advancing his or her academic language skills.
- **TRANSITIONING**
  As an ELL/MLL, shows some independence in advancing his or her academic language skills.
- **EMERGING**
  As an ELL/MLL, has some dependence on supports and structures to advance his or her academic language skills.
- **ENTERING**
  As an ELL/MLL, has great dependence on supports and structures to advance his or her academic language skills.

**ENGLISH LANGUAGE PROFICIENCY AREAS/MODALITIES**

**LISTENING**
- Students listen to determine information and develop ideas in grade-level academic discussions.

**SPEAKING**
- Students use grade-appropriate language to contribute to discussions about academic texts and topics.

**READING**
- Students read grade-level academic texts to determine information and develop ideas.

**WRITING**
- Students use grade-appropriate language to structure thoughts and ideas in writing, about literary and informational texts and topics.

These scale scores range from 30-90.
Balance the Four Skills in the Integrated ENL Class

- Don’t favor Reading and Writing Over Listening and Speaking

- According to Saunders, Goldenberg and Marcelletti (2013) “ELD Instruction Should Incorporate Reading and Writing But Should Emphasize Listening and Speaking”
Create Units with Connected Listening, Reading, Speaking, Writing

What I got from Listening; Viewing

What I got from Talking with My Partners

What I got from Reading Leveled Text

Writing
Analyzing Secondary Science and Social Studies Texts to Identify Language Demands and Language Learning Opportunities
### Types of Language Objectives

<table>
<thead>
<tr>
<th><strong>Linguistic</strong> vs. <strong>Communicative</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>Pronunciation</td>
</tr>
<tr>
<td>Vocabulary</td>
</tr>
<tr>
<td>Grammar (Word, Sentence Structure)</td>
</tr>
<tr>
<td>Discourse/Genre (Passage Structure)</td>
</tr>
<tr>
<td></td>
</tr>
<tr>
<td><strong>Communicative functions</strong></td>
</tr>
<tr>
<td><strong>Developmental Sequence of Output Expectations (Bilingual Progressions)</strong></td>
</tr>
</tbody>
</table>
Grammar

Vocabulary

Source: Dee Gardner, RITELL Conference, Fall 2015
### Finding language objectives in our texts

<table>
<thead>
<tr>
<th>Grammar</th>
<th>Vocabulary</th>
<th>Functions</th>
<th>Discourse</th>
<th>Strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td>The forms of language you will target (sounds, word parts, sentence structure)</td>
<td>The content compatible vocabulary you will target (key vocab. Is taught to all)</td>
<td>The “Can Do” indicators; communicative functions appropriate to proficiency level</td>
<td>Organization of speech; writing</td>
<td>Tactics student will use to support successful communication</td>
</tr>
</tbody>
</table>

**ELIs need more than just the key content vocabulary!**

We will use this framework
Differentiate Your Language Objectives

- Choose language that matches the proficiency of the learner

- For early proficiency students—basic vocabulary, basic sentence patterns, not much complexity

- For later proficiency students—advanced vocabulary, complex sentence patterns, demonstrate how to achieve greater sentence length and complexity
### Differentiated Grammar Teaching

<table>
<thead>
<tr>
<th>Level</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>Beginner</td>
<td>Entering/Emerging</td>
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<tr>
<td>Intermediate</td>
<td>Transitioning</td>
</tr>
<tr>
<td>Advanced</td>
<td>Expanding/Commanding</td>
</tr>
</tbody>
</table>
Let’s Read Our Sample Social Studies and Science Texts

Stock Market Crash

Cell Structure and Function

7-2 Eukaryotic Cell Structure

Guide for Reading

Key Concept
- What are the functions of the major cell structures?

Vocabulary
- organelle
- cytoplasm
- nuclear envelope
- nucleus
- chromosome
- mitochondrion
- ribosome
- endoplasmic reticulum
- Golgi apparatus
- lysosome
- vesicle
- microfilament
- cytoplasm
- centrosome

Reading Strategy: Building Vocabulary
Before you read, preview the vocabulary by skimming the section and making a list of the boldfaced terms. Leave space to make notes as you read.

Comparing the Cell to a Factory

At first glance, a factory is a puzzling place. A bewildering variety of machines buzz and clatter; people move quickly in different directions, and the sheer diversity of so much activity can be confusing. However, if you take your time and watch carefully, before long you will begin to identify patterns. What might at first seem like chaos begins to make sense.

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See Section We Will Focus On

INTERACT WITH HISTORY

The year is 1929. The U.S. economy has collapsed. Farms, businesses, and banks nationwide are failing, causing massive unemployment and poverty. You are out of work with little prospect of finding a job.

What would you do to feed your family?

Examine the Issues
- What groups of people will be most hurt by the economic crash?
- What can you do to find a paying job?
- What can unemployed and impoverished people do to help each other?

Visit the Chapter 22 links for more information related to The Great Depression Begins.

Women serve soup and slices of bread to unemployed men in an outdoor breadline in Los Angeles, California during the Great Depression.

USA

1929

1929

20th Academy Awards are presented.

1929 The stock market crashes.

1930-1932 More than 40% of the nation's banks fail.

1931 Great Depression begins.

1931. 8.3 million Americans are unemployed.

1932 The Bonus Army arrives in Washington, D.C.

1932 Franklin Delano Roosevelt is elected president.

1933 "Century of Progress" Exposition begins.

1933 The Twenty-First Amendment ends Prohibition.

1933 More than 13 million Americans are unemployed.

1934 The Great Depression begins.
The Nation's Sick Economy

Main Idea

As the prosperity of the 1920s ended, severe economic problems gripped the nation.

Why It Matters Now

The Great Depression has had lasting effects on how Americans view themselves and their government.

Terms & Names

- price support
- credit
- Alfred E. Smith
- Dow Jones industrial average
- speculator
- buying on margin
- Black Tuesday
- Great Depression
- Hoover-Smyth Tariff Act

One American's Story

Gordon Parks, a well-known photographer, author, and filmmaker, was a 15-year-old high school student in the fall of 1929. He suggested himself as a busboy at the exclusive Minnesota Club, where prosperous club members spoke confidently about the economy. Parks, too, looked forward to a bright future. Then came the stock market crash of October 1929. In his autobiography, Parks recalled his feelings at the time:

A Personal Voice: Gordon Parks

"I couldn't imagine such financial disaster touching my small world; my family concerned only the rich. But by the first week of November ... I was without a job. At that next week I searched for any kind of work that would support my living. Again it was, 'We're flying, not living ... I went to school and cleared out my locker, knowing it was impossible to stay on. A giving chill was in the air as I walked back to the rooming house.'"

The crash of 1929, and the depression that followed, dealt a crushing blow to the hopes and dreams of millions of Americans. The high-flying prosperity of the 1920s was over. Hard times had begun.

Economic Troubles on the Horizon

As the 1920s advanced, serious problems threatened economic prosperity. Though some Americans became wealthy, many more could not earn a decent living. Important industries struggled, and farmers grew more crops and raised more livestock than they could sell at a profit. Both consumers and farmers were steadily getting deeper into debt. As the decade drew to a close, these problems signaled the end of an era.
Americans were buying less—mainly because of rising prices, stagnant wages, unbalanced distribution of income, and overbuying on credit in the preceding years. Production had also expanded much faster than wages, resulting in an ever-widening gap between the rich and the poor.

**LIVING ON CREDIT** Although many Americans appeared to be prosperous during the 1920s, in fact they were living beyond their means. They often bought goods on credit—an arrangement in which consumers agreed to pay down and pay later for purchases. This was often in the form of an installment plan (usually in monthly payments) that included interest charges.

By making credit easily available, businesses encouraged Americans to pile up a large consumer debt. Many people then had trouble paying off their growing debts. Faced with consumers cut back on spending.

**UNEVEN DISTRIBUTION OF INCOME** During the 1920s, the rich got richer, and the poor got poorer. Between 1920 and 1929, the income of the wealthiest 1 percent of the population rose by 75 percent, compared with a 9 percent increase for Americans as a whole.

More than 70 percent of the nation’s families earned less than $2,500 per year, then considered the minimum amount needed for a decent standard of living. Even families earning twice that much could not afford many of the household products that manufacturers produced. Economists estimate that the average man or woman bought a new outfit of clothes only once a year. Scantily half the homes in many cities had electric lights or a furnace for heat. Only one city home in ten had an electric refrigerator.

This unequal distribution of income meant that most Americans could not participate fully in the economic advances of the 1920s. Many people did not have the money to purchase the new goods that factories produced. The prosperity of the era rested on a fragile foundation.

**Hoover Takes the Nation**

Although economic disaster was around the corner, the election of 1928 took place in a mood of apparent national prosperity. This election pitted Republican candidate Herbert Hoover against Democrat Alfred E. Smith.

**THE ELECTION OF 1928** Hoover, the secretary of commerce under Harding and Coolidge, was a mining engineer from Iowa who had never run for public office. Smith was a career politician who had served four terms as governor of New York. He was personable and enjoyed being in the limelight, unlike the quiet and reserved Hoover. Still, Hoover had one major advantage; he could point to years of prosperity under Republican administrations since 1920. Many Americans believed him when he declared, “We in America are nearer to the final triumph over poverty than ever before.”

It was an overwhelming victory for Hoover. The message was clear: most Americans were happy with Republican leadership.

**DREAMS OF RICHES IN THE STOCK MARKET** By 1929, some economists had warned of weaknesses in the economy, but most Americans maintained the utmost confidence in the nation’s economic health. In increasing numbers, those who could afford to invested in the stock market. The stock market had become the most visible symbol of a prosperous American economy. Then, as now, the Dow Jones Industrial Average was the most widely used barometer of the stock market’s health. The Dow is a measure based on the stock prices of 30 representative large firms trading on the New York Stock Exchange.

Through most of the 1920s, stock prices rose steadily. The Dow had reached a high of 381 points, nearly 300 points higher than it had been five years earlier. Eager to take advantage of this “bull market”—a period of rising stock prices—Americans rushed to buy stocks and bonds. One observer wrote, “It seemed as if all economic law had been suspended and a new era opened up in which success and prosperity could be had without knowledge or industry.” By 1929, about 4 million Americans—or 3 percent of the nation’s population—owned stocks. Many of these investors were already wealthy, but others were average Americans who hoped to strike it rich.

However, the seeds of trouble were taking root. People were engaging in speculation—that is, they bought stocks and bonds on the chance of a quick profit, while ignoring the risks. Many began buying on margin—paying a small percentage of a stock’s price as a down payment and borrowing the rest. With any money available to investors, the uncontrolled buying and selling fueled the market’s upward spiral. The government did little to discourage such buying or to regulate the market. In reality, these rising prices did not reflect companies’ worth. Worse, if the value of stocks declined, people who had bought on margin had no way to pay off the loans.

**The Stock Market Crashes**

In early September 1929, stock prices peaked and then fell. Confidence in the market started to waver, and some investors quickly sold their stocks and pulled out. On October 24, the market took a plunge. Panicked investors unloaded their shares. But the worst was yet to come.
BLACK TUESDAY On October 29—now known as Black Tuesday—the bottom fell out of the market and the nation’s confidence. Shareholders frantically tried to sell before prices plunged even lower. The number of shares dumped that day was a record 16.4 million. Additional millions of shares could not find buyers. People who had bought stocks on credit were stuck with huge debts as the prices plummeted, while others lost most of their savings.

Just Review the Pictures Here To Understand the Subtitle “Then and Now”

By mid-November, investors had lost about $30 billion, an amount equal to how much America spent in World War I. The stock market bubble had finally burst. One eyewitness to these events, Frederick Lewis Allen, described the resulting situation:

A PERSONAL VIEW (Frederick Lewis Allen)

"The Big Bull Market was dead. Billions of dollars’ worth of profits—and paper profits—had disappeared. The graces, the window cleaners, and the seminates had lost their capital (savings). In every town there were families which had suddenly dropped from shiny affluence into debt... With the Big Bull Market gone and prosperity going, Americans were soon to find themselves living in an altered world which called for new adjustments—new ideas, new habits of thought, and a new order of values."

—The Macleod

Financial Collapse

The stock market crash signaled the beginning of the Great Depression—the period (from 1929 to 1940) in which the economy plummeted and unemployment skyrocketed. The crash alone did not cause the Great Depression, but it hastened the collapse of the economy and made the depression more severe.

BANK AND BUSINESS FAILURES After the crash, many people panicked and withdrew their money from banks. Some couldn’t get their money because the banks had invested it in the stock market. In 1929, 1,000 banks closed; by 1933, 13,000 of the nation’s 25,000 banks had failed. Because the government did not protect or insure bank accounts, millions of people lost their savings accounts.

The Great Depression hit other businesses, too. Between 1929 and 1932, the gross national product—the nation’s total output of goods and services—was cut nearly in half, from $101 billion to $59 billion. Approximately 90,000 businesses went bankrupt. Among these failed enterprises were once-prosperous automobile and railroad companies.

As the economy plunged into a tailspin, millions of workers lost their jobs. Unemployment soared from 3 percent (1.6 million workers) in 1929 to 25 percent (11.7 million workers) in 1933. One out of every four workers was out of a job. Those who kept their jobs faced pay cuts and reduced hours.

Not everyone fared so badly, of course. Before the crash, some speculators had sold off their stocks and made money. Joseph P. Kennedy, the father of future president John F. Kennedy, was one who did. Most, however, were not so lucky or shrewd.

WORLDWIDE SHOCK WAVES The United States was not the only country gripped by the Great Depression. Much of Europe, for example, had suffered throughout the 1920s. European countries trying to recover from the ravages of World War I faced high war debts. In addition, Germany had to pay war reparations—payment to compensate the Allies for the damages Germany had caused. The Great Depression compounded these problems by limiting America’s ability to import European goods. This made it difficult to sell American farm products and manufactured goods abroad.
Depression Indicators

Economic indicators are measures that signal trends in a nation’s economy. During the Great Depression, several trends were apparent. Those indicated at the right are linked—the conditions of one can affect another. For instance, when banks fail, some businesses may have to close down, which can cause unemployment to rise. Thus, people may lose money and spending declines.

**SKILLBUILDER Interpreting Graphs**

1. In what year did the biggest jump in bank failures occur?
2. What measure on the graphs seems to indicate an improvement in the U.S. economy during the Depression? What might explain this?

**MAIN IDEA**

**SUMMARIZING**

1. How did the Great Depression affect the world economy?

**ASSESSMENT**

1. **TERMS & NAMES**
   - price support
   - credit
   - Dow Jones Industrial Average
   - speculation
   - Black Tuesday
   - buying on margin
   - Alfred E. Smith

2. **TAKING NOTES**
   In a diagram like this, record the causes of the 1929 stock market crash.

3. **MAKING INFERENCES**
   How did the economic trends of the 1930s help cause the Great Depression? Think About:
   - what happened in industry
   - what happened in agriculture
   - what happened with consumers

4. **DRAWING CONCLUSIONS**
   Judging from the events of the late 1920s and early 1930s, how important do you think public confidence is to the health of the economy? Explain. Think About:
   - what happened when overconfidence in the stock market led people to speculate and buy on margin
   - how confidence affects consumer borrowing

Record (list); explain

Just Read Box to Right if You Finish Early

by keeping interest rates low, thereby allowing companies and individuals to borrow easily and build up large debts. Some of this borrowed money was used to buy the stocks that later led to the crash.

At first people found it hard to realize that economic disaster had struck. In November 1929, President Hoover encouraged Americans to remain confident about the economy. Yet, the most severe depression in American history was well on its way.

**WORLD STAGE**

**GLOBAL EFFECTS OF THE DEPRESSION**

As the American economy collapsed, so too did Europe’s. The world’s nations had become interdependent; international trade was important to most countries. However, when the U.S. economy failed, American investors withdrew their money from European markets.

To keep U.S. dollars in America, the government raised tariffs on goods imported from other countries. World trade dropped. Unemployment rates around the world soared. Germany and Austria were particularly hard hit. In 1931, Austria’s largest bank failed. In Asia, both farmers and urban workers suffered as the value of exports fell by half between 1929 and 1931. The crash was felt in Latin America as well. As U.S. and European demand for Latin American products like sugar, beef, and copper dropped, prices collapsed.

**END**
Hardship and Suffering During the Depression

MAIN IDEA

During the Great Depression, Americans did what they had to do to survive.

WHY IT MATTERS NOW

Since the Great Depression, many Americans have been more cautious about saving, investing, and borrowing.

Terms & Names

- shantytown
- soup kitchen
- breadline
- Dust Bowl
- direct relief

One American’s Story

Ann Marie Low lived on her parents’ North Dakota farm when the stock market crashed in 1929 and the Great Depression hit. Hard times were familiar to Ann’s family. But the worst was yet to come. In the early 1930s, a ravenous drought hit the Great Plains, destroying crops and leaving the earth dry and cracked. Then came the deadly dust storms. On April 25, 1934, Ann wrote an account in her diary.

A PERSONAL VOICE  ANN MARIE LOW

"[T]he air is just full of dirt coming, literally, for hundreds of miles. It sifts into everything. After we wash the dishes and put them away, so much dust sifts into the cupboards we must wash them again before the next meal. . . . Newspapers say the deaths of many babies and old people are attributed to breathing so much dirt."

—Dust Bowl Diary

The drought and winds lasted for more than seven years. The dust storms in Kansas, Colorado, New Mexico, Nebraska, the Dakotas, Oklahoma, and Texas were a great hardship—but only one of many—that Americans faced during the Great Depression.

The Depression Devastates People’s Lives

Statistics such as the unemployment rate tell only part of the story of the Great Depression. More important was the impact that it had on people’s lives: the Depression brought hardship, homelessness, and hunger to millions.

THE DEPRESSION IN THE CITIES

In cities across the country, people lost their jobs, were evicted from their homes and ended up in the streets. Some slept in parks or sewer pipes, wrapping themselves in newspapers to fend off the cold.

Unit Goes on to the Dust Bowl and New Deal

The Dust Bowl, 1933–1936

The drought that began in the early 1930s wreaked havoc on the Great Plains. During the previous decade, farmers from Texas to North Dakota had used tractors to break up the prairies and plant millions of acres of new farmland. Failing crops had reduced the thick protective layer of prairie grasses. Farmers then exhausted the land through overproduction of crops, and the land became unsuitable for farming. When the drought and winds began in the early 1930s, little grass and few trees remained. Wind scattered the topsoil, exposing sand and gravel and traveled hundreds of miles. One windstorm in 1934 picked up dust from the plains and carried it to East Coast cities.

THE DUST BOWL

Chicago, Nov. 29, 1933

The Chicago Times, world’s largest daily, estimates that 200,000 acres of wheat and corn have been plowed under by dust storms.

Boston, May 1934

Millions of dust storms have been reported in the Midwest, killing thousands of cattle and destroying crops.

New York City, May 12, 1934

Dust storms have been reported in the Midwest, affecting thousands of people and causing widespread destruction.

THE DUST BOWL

The drought that began in the early 1930s wreaked havoc on the Great Plains. During the previous decade, farmers from Texas to North Dakota had used tractors to break up the prairies and plant millions of acres of new farmland. Failing crops had reduced the thick protective layer of prairie grasses. Farmers then exhausted the land through overproduction of crops, and the land became unsuitable for farming. When the drought and winds began in the early 1930s, little grass and few trees remained. Wind scattered the topsoil, exposing sand and gravel and traveled hundreds of miles. One windstorm in 1934 picked up dust from the plains and carried it to East Coast cities.

The Dust Bowl, 1933–1936

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Cell Structure and Function
7–2 Eukaryotic Cell Structure

At first glance, a factory is a puzzling place. A bewildering variety of machines buzz and clatter, people move quickly in different directions, and the sheer diversity of so much activity can be confusing. However, if you take your time and explore long enough, you will begin to identify patterns that have seemed like chaos begin to make sense.

Comparing the Cell to a Factory

In some respects, the eukaryotic cell is like a factory. The first time you look at a microscope image of a cell, such as the one in Figure 7–5, the cell seems impossibly complex. Look closely at a eukaryotic cell, however, and patterns begin to emerge. To see these patterns more clearly, we’ll look at some structures that are common to eukaryotic cells, shown in Figure 7–6. Because many of these structures act as if they are specialized organs, these structures are known as organelles, literally “little organs.”

Cell biologists divide the eukaryotic cell into two major parts: the nucleus and the cytoplasm. The cytoplasm is the portion of the cell outside the nucleus. As you will see, the nucleus and cytoplasm work together in the business of life.
**Nucleus**

In the same way that the main office controls a large factory, the nucleus is the control center of the cell. The nucleus contains nearly all the cell's DNA and with it the coded instructions for making proteins and other important molecules. The structure of the nucleus is shown in Figure 7-7.

The nucleus is surrounded by a nuclear envelope composed of two membranes. The nuclear envelope is dotted with thousands of nuclear pores, which allow material to move into and out of the nucleus. Like messages, instructions, and blueprints moving in and out of a main office, a steady stream of proteins, RNA, and other molecules move through the nuclear pores to and from the rest of the cell.

The granular material you can see in the nucleus is called chromatin. Chromatin consists of DNA bound to protein. Most of the time, chromatin is spread throughout the nucleus. When a cell divides, however, chromatin condenses to form chromosomes (KROH-mz). These distinct, threadlike structures contain the genetic information that is passed from one generation of cells to the next. You will learn more about chromosomes in later chapters.

Most nuclei also contain a small, dense region known as the nucleolus (N00-KLEE-uh-lus). The nucleolus is where the assembly of ribosomes begins.

**Ribosomes**

One of the most important jobs carried out in the cellular "factory" is making proteins. Proteins are assembled on ribosomes. Ribosomes are small particles of RNA and protein found throughout the cytoplasm. They produce proteins by following coded instructions that come from the nucleus. Each ribosome, in its own way, is like a small machine in a factory, turning out proteins on orders that come from its "boss"—the cell nucleus. Cells that are active in protein synthesis are often packed with ribosomes.

**Endoplasmic Reticulum**

Eukaryotic cells also contain an internal membrane system known as the endoplasmic reticulum (en-DOH-PLAZ-mik /uh-TRIHIH-kwuh-lum), or ER. The endoplasmic reticulum is the site where lipid components of the cell membrane are assembled, along with proteins and other materials that are exported from the cell.

The portion of the ER involved in the synthesis of proteins is called rough endoplasmic reticulum, or rough ER. It is given this name because of the ribosomes found on its surface. Newly made proteins leave these ribosomes and are inserted into the rough ER, where they may be chemically modified.
Lysosomes

Even the neatest, cleanest factory needs a cleanup crew, and that’s what lysosomes (LY-suhs-sohr-mz) are. Lysosomes are small organelles filled with enzymes. One function of lysosomes is the digestion, or breakdown, of lipids, carbohydrates, and proteins into small molecules that can be used by the rest of the cell.

Lysosomes are also involved in breaking down organelles that have outlived their usefulness. Lysosomes perform the vital function of removing “junk” that might otherwise accumulate and clutter up the cell. A number of serious human diseases, including Tay-Sachs disease, can be traced to lysosomes that fail to function properly.

**What is the role of lysosomes?**

Vacuoles

Every factory needs a place to store things, and cells contain places for storage as well. Some kinds of cells contain sac-like structures called vacuoles (VAY-oo-ohz) that store materials such as water, salts, proteins, and carbohydrates. In many plant cells there is a single, large central vacuole filled with liquid. The pressure of the central vacuole in these cells makes it possible for plants to support heavy structures such as leaves and flowers.

Vacuoles are also found in some single-celled organisms and in some animals. The paramecium in Figure 7-10 contains a vacuole called a contractile vacuole. By contracting rhythmically, this specialized vacuole pumps excess water out of the cell. The control of water content within the cell is just one example of an important process known as homeostasis. Homeostasis is the maintenance of a controlled internal environment.

Mitochondria and Chloroplasts

All living things require a source of energy. Factories are hooked up to the local power company, but what about cells? Most cells get energy in one of two ways—from food molecules or from the sun.

**Mitochondria**. Nearly all eukaryotic cells, including plants, contain mitochondria (my-oh-KAHN-dree-uh; singular: mitochondrion). Mitochondria are organelles that convert the chemical energy stored in food into compounds that are more convenient for the cell to use. Mitochondria are enclosed by two membranes—an outer membrane and an inner membrane. The inner membrane is folded up inside the organelle.

One of the most interesting aspects of mitochondria is the way in which they are inherited. In humans, all or nearly all of our mitochondria come from the cytoplasm of the ovum, or egg cell. This means that when your relatives are discussing which side of the family should take credit for your best characteristics, you can tell them that you got your mitochondria from Mom!
How can you make a model of a cell?

Materials: variety of craft supplies, index cards

Procedure:
1. Your class is going to make a model of the cell part or organelle you chose. Make the model as complete and as accurate as you can.
2. Using materials of your choice, make a three-dimensional model of the cell part or organelle you chose. Make the model as complete and as accurate as you can.
3. Label an index card with the name of your cell part and organelle and list its main features and functions. Attach the card to your model.

Visuals added to aid students in having visual support.
**Cytoskeleton**

A supporting structure and a transportation system complete our picture of the cell as a factory. As you know, a factory building is supported by steel or cement beams and by columns that support its walls and roof. Eukaryotic cells have a structure—the **cytoskeleton**—that helps support the cell. **The cytoskeleton is a network of protein filaments that helps the cell to maintain its shape.** The cytoskeleton is also involved in movement.

Microfilaments and microtubules are two of the principal protein filaments that make up the cytoskeleton. Microfilaments are threadlike structures made of a protein called actin. They form extensive networks in some cells and produce a tough, flexible framework that supports the cell. Microfilaments also help cells move. Microfilament assembly and disassembly is responsible for the cytoplasmic movements that allow cells, such as amoebas, to crawl along surfaces.

Microtubules, as shown in Figure 7-11, are hollow structures made up of proteins known as tubulins. In many cells, they play critical roles in maintaining cell shape. Microtubules are also important in cell division, where they form a structure known as the mitotic spindle, which helps to separate chromosomes. In animal cells, tubulin is also used to form a pair of structures known as centrioles. Centrioles are located near the nucleus and help to organize cell division. Centrioles are not found in plant cells.

Microtubules also help to build projections from the cell surface, which are known as cilia (singular: cilium) and flagella (singular: flagellum), that enable cells to swim rapidly through liquids. Cilia and flagella can produce considerable force; and in some cells they move almost like the oars of a boat, pulling or pushing cells through the water. You will learn more about cilia and flagella in later chapters.

**Figure 7-11** The cytoskeleton is a network of protein filaments that helps the cell to maintain its shape and is involved in many forms of cell movement. The micrograph shows the microtubules of kidney cells. Microtubules are part of the cytoskeleton that help maintain cell shape.

---

**Writing in Science**

**Persuasive Writing**

Image that you are Lynn Margulis. Write a persuasive letter to the editor of a magazine, explaining your idea. Your explanation should be clear to people who do not have a biology background. **Hint:** Review the concept of symbiosis in Section 4-2.
Instructional Planning for Integrated ENL Instruction
### Planning Instruction for ELLs in Integrated Content Area Classes

<table>
<thead>
<tr>
<th>Area</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Background Knowledge to Build</td>
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<tr>
<td>Academic Vocabulary to Develop</td>
<td></td>
</tr>
<tr>
<td>Forms of Language (Grammar) to Practice</td>
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<tr>
<td>Text Structure to Support (Discourse Structure)</td>
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<tr>
<td>Reading Skills and Strategies to Practice</td>
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<tr>
<td>Map/Graphic Skills to Practice</td>
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<tr>
<td>Communicative Functions Expected (Bilingual Progressions; with Differentiation for ELLs of Varied Proficiency Levels)</td>
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</table>

*Based on Access to Academics: Planning Instruction for K-12 Classrooms with ELLs (Egbert + Ernst-Slavit, 2011, Pearson)*
# Background Knowledge

<table>
<thead>
<tr>
<th>Stock Market Crash</th>
<th>Cell Structure</th>
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<tbody>
<tr>
<td>Dow Jones</td>
<td>Factory (for metaphor); jobs, tasks, functions, shipping</td>
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<tr>
<td>Stock Market</td>
<td>Biologists</td>
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<tr>
<td>Stocks</td>
<td>DNA/RNA</td>
</tr>
<tr>
<td>Borrow/Buy on margin</td>
<td>Molecules</td>
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<tr>
<td>Speculate</td>
<td>Protein, Carbohydrates</td>
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<tr>
<td>Credit (vs. Savings)</td>
<td>Digestion</td>
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<tr>
<td>Bankruptcy</td>
<td>Disease</td>
</tr>
<tr>
<td></td>
<td>Power/Force/Pressure</td>
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</table>
Using Video to Frontload Background Information Prior to Reading

--Watch rate of speech
--Look at visual support while audio plays—is helpful in explaining content shared?
--Length of video (2-3 minutes optimal)
--Play several times using active listening activities (focus students’ viewing; stop to discuss in 1 minute segments; use supplemental visuals as needed)
--OK for Transitioning /Expanding ELLs enrolled in integrated ENL content classes?
The Stock Market Crash

https://www.youtube.com/watch?v=ehy2jEeNuWk

Corporation, stock, stock exchange/stock market; Dow Jones Industrial Average, index, economic growth, economic analyst, trading, investor, economy, bankruptcy
**Focused Viewing**

| A. List 3 things cells have in common | B. What are the two major categories of cells? How do they differ? | C. What are organelles? What does the nucleus do? |

Let's Try A Focused Viewing Activity!
How Did Focused Viewing Change Your Listening and Capturing of Information?

Cell Structure Video: Frontloading
https://www.youtube.com/watch?v=URUJD5NEXC8
Spanish Version: Overview
https://www.youtube.com/watch?v=JwXrDyiN_SM
19:28 minutes
### Planning Instruction for ELLs in Integrated Content Area Classes

<table>
<thead>
<tr>
<th>Background Knowledge to Build</th>
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<tbody>
<tr>
<td>Academic Vocabulary to Develop</td>
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<td>Map/Graphic Skills to Practice</td>
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<tr>
<td>Communicative Functions Expected (Bilingual Progressions; with Differentiation for ELLs of Varied Proficiency Levels)</td>
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Based on Access to Academics: Planning Instruction for K-12 Classrooms with ELLs (Egbert + Ernst-Slavit, 2011, Pearson)
## Academic Vocabulary Levels (New Approach)

<table>
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<tr>
<th>Academic Core (AVL)</th>
<th>Discipline Core</th>
<th>Discipline Technical</th>
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<tbody>
<tr>
<td>Cross-Discipline</td>
<td>Discipline-Specific from General Core</td>
<td>Discipline-Specific</td>
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</tbody>
</table>

### Multi-Disciplinary Words
- study (n)
- group (n)
- system (n)
- social (j)
- provide (v)
- however (r)
- research (n)
- level (n)
- result (n)
- include (v)
- important (j)
- process (n)
- use (n)
- development (n)
- data (n)
- information (n)
- effect (n)
- change (n)
- table (n)
- policy (n)
- university (n)
- model (n)

### Science*
- star (n)
- species (n)
- plant (n)
- scientist (n)
- surface (n)
- earth (n)
- software (n)
- forest (n)
- sun (n)
- fish (n)
- planet (n)
- temperature (n)
- soil (n)
- camera (n)
- fuel (n)
- speed (n)
- universe (n)
- sky (n)
- file (n)
- drive (n)
- engine (n)
- moon (n)

### Science
- genome (n)
- gravitational (j)
- reactor (n)
- extinction (n)
- watershed (n)
- supernova (n)
- aquatic (j)
- photon (n)
- terrestrial (j)
- latitude (n)
- semiconductor (n)
# Examples of AVL Word Families

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<td>active (n) Med 39</td>
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</table>
- **Depression**
- **Economy** (economist)
- Prosperity
- Election
- Stock Market
- Disaster
- Stocks; Bonds
- Price(s)
- Company/Firm/Business
- Worth
- Savings; Bank/Banking
- **Unemployment**

- Prosper
- Invest
- Rise
- Own
- Borrow
- Buy/Sell (Dump)
- **Decline** (crash, plunge)
- **Increase**
- Lose (a job; savings)
- **Recover**

Superscript denotes an AVL word frequency.

- Rich
- Poor
- Shrewd
- Lucky/unlucky
- Bankrupt
| 37 | economy | 60070 | \textbf{economic} (j) 5238 | \textbf{economy} (n) 23059 | \textbf{economics} (n) 4885 | \textbf{economist} (n) 3346 | \textbf{economically} (r) 2817 | \textbf{economical} (j) 538 | \textbf{economize} (v) 74 | \textbf{uneconomic} (j) 43 | \textbf{uneconomical} (j) 30 |
Cell vocabulary

- Identify
- Pattern
- Controls
- Processes
- Contains
- Combines
- Condenses
- Synthesizes
- Convert
- Function

- Eukaryotic cell
- Organelle
- Cytoplasm
- Nuclear envelope
- Chromatin
- Chromosome
- Nucleolus
- Ribosome

- Endoplasmic reticulum
- Gogli apparatus
- Lysosome
- Vacuole
- Mitochondrion
- Chloroplast
- Cytoskeleton
- Centriole

- DNA
- RNA
- Disease
- Digestion

AVL Cross-Discipline Words

Discipline: Technical

Types of Biological Cells
- Prokaryotic Cells (Prokaryotes)
  - have no nucleus or membrane-bound organelles
  - e.g. bacteria cells.
- Eukaryotic Cells (Eukaryotes)
  - always have nucleus & other membrane-bound organelles
- Plant Cells
- Animal Cells

Simple summary of words used to refer to types of cells included in introductory biology courses. There are many characteristics & examples.
Actively Build All of the Vocabulary Sets As You Teach Reading and Writing!

4 Vocabulary Sets
Montgomery
Try it out

Choose vocabulary to teach
Choose only 6-8 words to teach intensively
Frontloading Vocabulary

SELECTING VOCABULARY TO TEACH

INSURING COMPREHENSION

PROVIDING PRACTICE
Vocabulary

- Depression
- Economy (economist)
- Prosperity
- Election
- Stock Market
- Disaster
- Stocks; Bonds
- Price(s)
- Company/Firm/Business
- Worth
- Savings; Bank/Banking
- Unemployment

- Prosper
- Invest
- Rise
- Own
- Borrow
- Buy/Sell (Dump)
- Decline (crash, plunge)
- Increase
- Lose (a job; savings)
- Recover

Jot It Down

- Rich
- Poor
- Shrewd
- Lucky/unlucky
- Bankrupt
Cell vocabulary

- Biologists
- Structures
- Protein
- Carbohydrate
- Membrane
- Molecule
- Pressure
- Power
- Force
- Bound

- Identify
- Pattern
- Controls
- Processes
- Contains
- Combines
- Condenses
- Synthesizes
- Convert
- Function

- Eukaryotic cell
- Organelle
- Cytoplasm
- Nuclear envelope
- Chromatin
- Chromosome
- Nucleolus
- Ribosome

- Endoplasmic reticulum
- Gogli apparatus
- Lysosome
- Vacuole
- Mitochondrion
- Chloroplast
- Cytoskeleton
- Centriole

- DNA
- RNA
- Disease
- Digestion

Types of Biological Cells

- Prokaryotic Cells (Prokaryotes)
  - have no nucleus or membrane-bound organelles
  - e.g. bacteria cells.

- Eukaryotic Cells (Eukaryotes)
  - always have nucleus & other membrane-bound organelles

- Plant Cells
- Animal Cells
Vocabulary Self-Awareness

### VOCABULARY IN CONTEXT

<table>
<thead>
<tr>
<th>word</th>
<th>I recognize it in context, I think it has something to do with</th>
<th>I have never seen the word before, so to learn about it I will</th>
<th>I have heard of the word, but I don't know what it means. To understand it, I am going to</th>
<th>I know the word, it means</th>
</tr>
</thead>
</table>

- **Candidate Words**
- **Individualize Vocabulary Work!**
## Meaning Making

<table>
<thead>
<tr>
<th>Prefix</th>
<th>Word</th>
<th>Suffix</th>
<th>New Word</th>
<th>Meaning</th>
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<td>save</td>
<td>-ings</td>
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*Drop the “e”*