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DemiDec Cram Kits

Cram Kits are part of our Complete Course of Studies.
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Where do Cram Kits fit in the Course of Studies?

Our **Resource Guides** teach the curriculum.
Our **Power Guides** break it down detail by detail.

And our **Cram Kits** are designed
for effective last-minute review.

ART FUNDAMENTALS

Elements of Art

THE SIX ELEMENTS OF ART

MEMORY DEVICE

LINE creates SHAPES and FORMS; these take up SPACE

To see COLOR and feel TEXTURE, you must perceive (PERSPECTIVE)

Line

- ◆ Most basic element
- ◆ Implied lines are NOT continuous
- ◆ Vertical lines move the eye upwards
- ◆ Horizontal lines feel peaceful
- ◆ A horizon line is where the sky and ground meet

Shape and Form

- ◆ Shape is 2-D; form is 3-D
- ◆ Geometric (square & cube; circle & sphere)
- ◆ Freeform shapes and forms are found in nature; they convey a sense of movement and rhythm

Space

- ◆ The objects take up positive space
- ◆ Figure: the objects in the positive space
- ◆ Emptiness is negative space, or ground
- ◆ Closed space feels stable and solid
- ◆ Open spaces feel lighter and airier

Color

- ◆ Hue is the name of a color
- ◆ Neutrals are black and white; NOT hues
- ◆ Value is the lightness/darkness
- ◆ Lighter hue is a tint
- ◆ Darker hue is a shade
- ◆ Intensity (saturation, chroma) is the color's brightness or purity

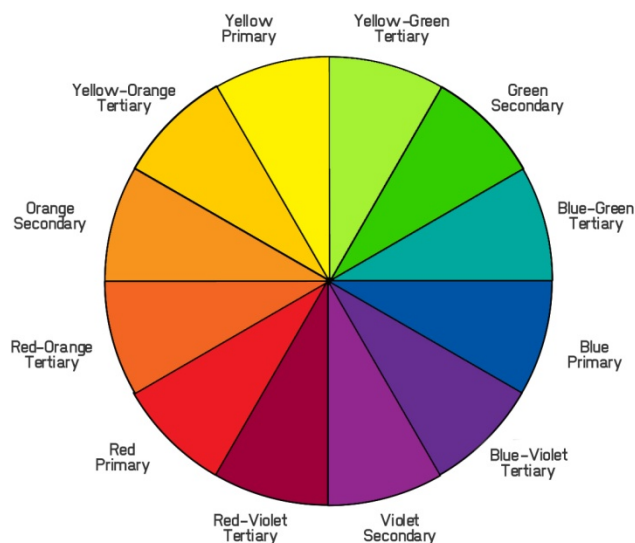
Texture

- ◆ Actual texture can be physically touched
- ◆ Visual texture is the illusion created by the artist

Perspective

- ◆ Creation of visual depth
- ◆ Intuitive: smaller objects are further away
- ◆ Isometric: "iso" = same size (regardless of distance)
- ◆ Aerial: use of smoke and fog
- ◆ Linear: vanishing points and orthogonal lines

FOCUS ON: COLOR



MEMORIZE THE (SUBTRACTIVE) COLOR WHEEL

1. Draw a circle, split it into fourths and then thirds (12 spaces total)
2. Start with any space you like and label it RED
3. Skip a space and label it ORANGE
4. Repeat for the acronym ROYGBV
5. To fill in the other spaces, simply combine the two bordering colors (for example, the space between red and orange is red-orange)
6. Now label the type of each color

ROYGBV alternates between **primary** and **secondary** colors.

Primary: red, yellow, blue

Secondary: orange, green, violet

Tertiary (intermediate): primary and secondary

COLOR SCHEME

MEMORY TIP

Complementary

These colors **complement** each other; they reach directly opposite the wheel to find their partner

Analogous

Analogous and **Adjacent**; colors next to each other

Monochromatic

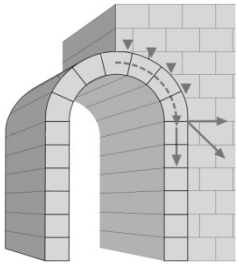
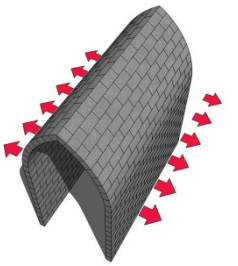
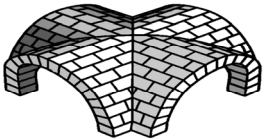
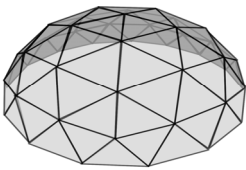
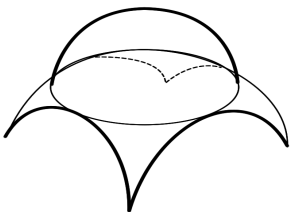
"Mono" = one hue; different shades/tints

Triadic

"Tri" = three evenly spaced hues (for example, the three primary colors)

ART FUNDAMENTALS

Architecture (Page 2 of 2)

ARCHES, VAULTS, AND DOMES		CATHEDRAL CHECKLIST
<u>VARIOUS STRUCTURES</u>		<ul style="list-style-type: none"> ✓ Clerestory: row of windows above the aisle ✓ Cloister: open space in a monastery surrounded by an arcaded walkway ✓ Flying buttresses: external arches; allow for greater height ✓ Predella: altarpiece rests on this narrow ledge ✓ Reliquary: container for a saint's remains ✓ Triforium: Arcaded gallery above the arches of the nave ✓ Triptych: Three paneled, carved work; three "wings"
PICTURE	KEY TERMS	BALANCING ACTS
 <p style="text-align: center;">Arch</p>	<p>Abutment: supports arches at the end</p> <p>Imposts: wall brackets that support arches</p>	<p>Balcony: structure that projects from a building</p> <p>Corbel: piece of stone jutting out to support weight</p> <p>Cantilever: balcony without supports</p> <p>Belvedere: structure that takes advantage of a scenic view</p>
 <p style="text-align: center;">Barrel Vault</p>	<p>Barrel vault: made from connected arches</p> <p>Annular: term for ring-shaped barrel vaults</p> <p>A tunnel is an example.</p>	GREEKS AND ROMANS
 <p style="text-align: center;">Groin/Double Barrel Vault</p>	<p>Groin vault: made from intersection of two barrel vaults</p>	<u>GREEK TEMPLES</u>
 <p style="text-align: center;">Geodesic Dome</p>	<p>Geodesic dome: interlocking pattern of triangles</p> <p>The Epcot Center is an example.</p>	<ol style="list-style-type: none"> 1. The _____ was the central entryway to a temple 2. The inner chamber of a temple is the _____. 3. A temple devoted to all gods is called a _____.
 <p style="text-align: center;">Pendentive</p>	<p>Pendentives: triangular segments added to the dome's base</p> <p>The Hagia Sophia is an example.</p>	<p>ANSWERS</p> <ol style="list-style-type: none"> 1. peristyle 2. cella 3. pantheon
		<u>ROMAN CONCRETE</u>
		<p>Ingredients: water, stone, gravel, and binder (lime or clay)</p> <p>Construction uses: aqueducts, baths, and public works projects</p>
		STUDY TIPS
		<ul style="list-style-type: none"> ◆ Don't mix up <i>triforium</i> and <i>triptych</i> ◆ Know the ingredients for concrete; these facts make a perfect NOT/EXCEPT question ◆ When asked about arches, domes, and vaults, take time to visualize before choosing an answer

THE MAYA

QUICK SUMMARY

THE PAST AND THE PRESENT

Scholars study the Maya civilization by consulting accounts written by Spanish *conquistadores*. Today, the present-day Maya peoples preserve remnants of this ancient culture.

HISTORY

- ◆ Emerged during the Preclassic Period
- ◆ Cities appeared in the late Preclassic and Classic Periods
- ◆ Endured to the Post-Classic Period
- ◆ 7.5 million people today are of Maya descent

GEOGRAPHY

- ◆ Territory covered highlands and lowlands
- ◆ Encompassed Guatemala, Belize, El Salvador, and Honduras
- ◆ Crops included squash, chile peppers, maize, and beans
- ◆ Natural resources included limestone, obsidian, and salt beds
- ◆ Salt was a profitable trading item

RELIGION

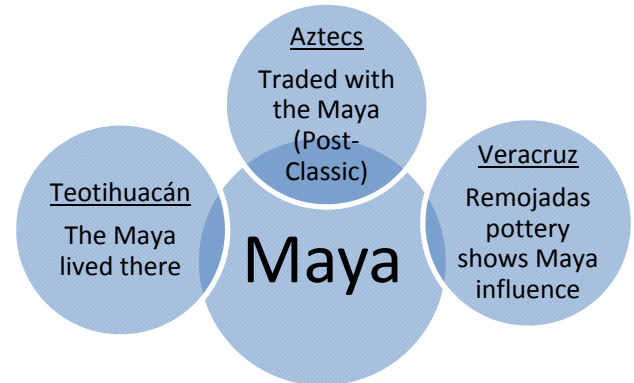
- ◆ Believed in multiple gods in the land, heavens, and underworld
- ◆ Revered cave formations
- ◆ Reciprocal relationship with gods
- ◆ “Cyclical” nature of time
- ◆ Ritual ballgames
- ◆ Auto-sacrifice (bloodletting) and ritual sacrifice

MATERIAL CULTURE

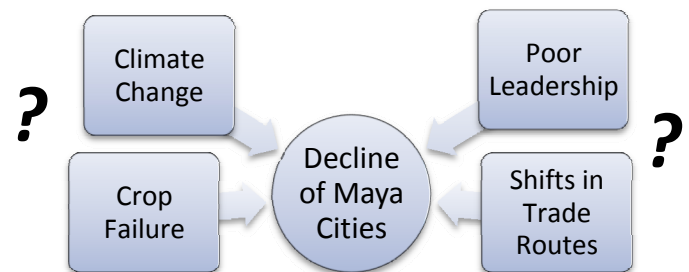
- ◆ Possessed a writing system by the Classic Period
- ◆ Used Long Count for dating sculptures and monuments
- ◆ Relied on Neolithic technology
- ◆ Created polychromed (colorful) sculptures
- ◆ Produced codices on bark paper; these documents recorded Maya history and religion

FOCUS ON: CROSS-CULTURAL CONTACT

Beginning in the Classic Period, the Maya interacted with other groups in Mesoamerica.



FOCUS ON: THE DECLINE OF THE MAYA



Classic Maya cities in the southern lowlands declined in the Post-Classic Period. Those in the north thrived. Why?

QUICK QUIZ

QUESTIONS

1. What is one similarity between the Olmec and Maya societies?
2. The Maya used which natural resource for tools?
3. What was the greatest gift that the gods gave the Maya?
4. What countries did the Maya empire cover?
5. How were the Maya unique from other Classic Period cultures in Mesoamerica?

ANSWERS

1. Both societies were hierarchal; on top were secular leaders, followed by priests and warriors.
2. Obsidian
3. Life
4. Honduras, Guatemala, Belize, El Salvador
5. The Maya had a sophisticated writing system.

STANDING FEMALES (PAGE 1 OF 2)

STANDING FEMALE, JALISCO



VITAL FACTS

This sculpture is on the left side of the Reproductions booklet.

It is a ceramic artwork dating from 200 B.C.

STANDING FEMALE, MICHOACÁN



VITAL FACTS

This sculpture is on the right side of the Reproductions booklet.

It is an earthenware artwork dating from 200 B.C.

BODY PART	VISUAL ANALYSIS
Face (Eyes? Nose?)	Coffee bean-shaped eyes Large nose in proportion to face
Body (Compared to Standing Female, Michoacán?)	Taller and thinner body
Limbs (Arms? Right hand? Left hand?)	Long and elastic arms Right hand on necklace Left hand on waist
Decoration (Jewelry? Belt? Headdress?)	Simpler jewelry <u>Necklace</u> : one circular bead <u>Belt</u> : cover for groin area <u>Headdress</u> : clay coil brim

BODY PART	VISUAL ANALYSIS
Face (Eyes? Nose? Mouth?)	Generalized face Coffee-shaped eyes Long and thin nose Raised clay circle mouth
Body (Hips? Stomach? Navel?)	Short and squat body Broad hips Bulging stomach Hole for the navel Nipples
Limbs (Arms? Fingers? Toes?)	Short arms Two grooves for fingers on each hand Three grooves for toes on each foot
Decoration (Scars? Jewelry?)	Earrings <u>Scarification</u> : four raised circles <u>Necklace</u> : three shells or stones <u>Headdress</u> : multi-tiered

CHALLENGE YOURSELF

Cover up the right column and see if you can fill in the facts by yourself. The questions in parenthesis should help jog your memory.

DIFFERENCES FROM STANDING FEMALE, JALISCO

- ◆ Shorter stature
- ◆ Fatter body
- ◆ Visible genitals
- ◆ Fancier jewelry

Expect a "NOT" or "EXCEPT" question from this list of four.

MOSAIC SKULL AND JAW

HOW TO MAKE A MOSAIC MASK

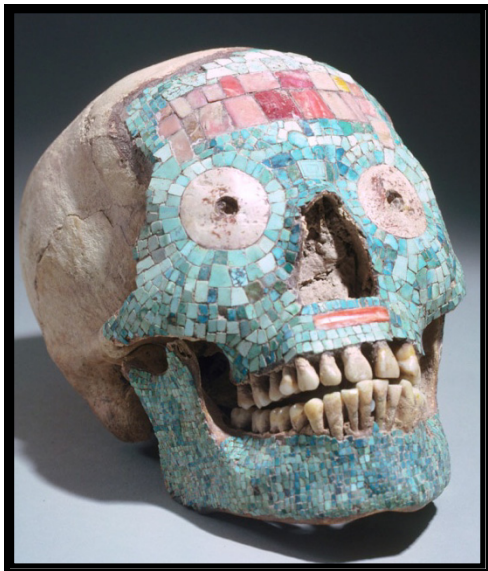
WHAT YOU NEED

- ✓ One human skull, with a decomposed nose and intact teeth and jawbone
- ✓ Rose, white, and turquoise tiles

DIRECTIONS

1. Cut and polish the tiles
2. Using the rose tiles, create a band going across the forehead and another one beneath the nose
3. Place white tile pieces around the pupils
4. Poke a hole for the pupils
5. Create a circular border around the eyes with the turquoise tiles
6. Finally, cover the remaining front face with turquoise; leave the back section undecorated

THE FINAL PRODUCT



SAFETY WARNINGS

Keep mask away from *conquistadores*! Your art may end up in one of their museums in Spain. Of course, this means it has a better chance of being preserved for posterity...

DID YOU KNOW?

Mosaic Skull and Jaw comes from the Aztec civilization. It dates from 1350 to 1521.

The piece includes bone, teeth, and stone mosaic. It features “open, alert” eyes and a “bizarre” face.

AWESOME ART ADS

EXTRA SKULLS? Donate your skulls to Tenochtitlán.

We accept skulls from ritual sacrifice at the central temple *tzompantli* (skull rack). We may also use your skull as a gift to the gods or a burial item. Skulls from battles or ballgames serve as trophies.

Note: Skull racks are only available from the Epiclassic Period onwards

FOR SALE: Buy a mosaic mask of Tezcatlipoca, God of the Smoking Mirror and creator deity! This high-quality lignite and turquoise mask is perfect for any Aztec priest.

Please contact the British Museum in London.

WANTED: Olmecs to build mosaic pavements at La Venta. Experience with serpentine blocks required.

QUICK QUIZ

MOSAIC SKULL AND JAW

1. Which color dominates *Mosaic Skull and Jaw*?
2. What are the THREE colors that appear on this mask?
3. Which part is decomposed?
4. Approximately when was it made?

HISTORICAL CONTEXT

1. Who is the God of the Smoking Mirror?
2. In which historical period did skull racks emerge?
3. Which site features serpentine block pavements?
4. Which civilization created mosaic pavements?

ANSWERS

1. Turquoise
2. Rose, white, turquoise
3. Nose
4. Between 1350 and 1521
5. Tezcatlipoca
6. Epiclassic Period
7. La Venta
8. Olmec

FUNDAMENTAL ECONOMIC CONCEPTS

Scarcity and Factors of Production

INTRODUCING ECONOMICS AND COSTS

WHAT IS ECONOMICS?

A social science which attempts to determine the optimal way to satisfy unlimited wants with scarce resources

THE BASIC ECONOMIC PROBLEM



- ◆ To decide which wants to satisfy with scarce resources, individuals ultimately try to maximize utility, or satisfaction

COSTS OF ECONOMIC DECISIONS

Any decision that we make entails a sacrifice. This sacrifice can come in the form of time, money, or both; in economics, they are known as costs.

TYPES OF COSTS

Name	Explanation	A.K.A.
Accounting Cost	Monetary cost incurred	Explicit Cost
Opportunity Cost	Value of the next-best alternative to the chosen decision	Implicit Cost
Total Economic Cost	Accounting Cost + Opportunity Cost	N/A

Costs in Action!

The next time you head to the movies, think about these costs:

Accounting Cost
The price of the movie ticket

Opportunity Cost
The benefit of studying economics instead

Economic Cost
The sum of these two costs

FACTORS OF PRODUCTION

SUMMARY

Factors of production are used to produce goods and services to satisfy wants. They are also called productive resources.

THE FOUR FACTORS

1. Land: land and natural resources extracted from the land
2. Labor: the human effort required to produce a good or service
3. Capital: final goods used to produce other goods
4. Entrepreneurship: the combination of the other three factors of production to produce a good or service

Factor	Payment	Examples
Land	Rent	Coal, oil, trees
Labor	Wages	Writing this Cram Kit
Capital	Interest	Industrial machinery
Entrepreneurship	Profit	DemiDec Dan

MISCELLANEOUS NOTES

- ◆ The productivity of labor can be increased by investing in human capital with education or training
- ◆ Entrepreneurship involves risk-taking, since businesses may fail

POP QUIZ

QUESTIONS

1. The value of the next best alternative to a given course of action is called its _____.
2. Economics is the study of _____.
3. The \$20,000 Steve paid for his new car is an example of a(n) _____.
4. The factor payment for capital is known as _____.

ANSWERS

1. opportunity cost
2. scarcity
3. accounting cost
4. interest

FUNDAMENTAL ECONOMIC CONCEPTS

Production Possibilities Frontier

EXPLAINING THE PPF

SCARCITY AND PRODUCTION

Because resources are scarce, producers face trade-offs in deciding what to produce. The production possibilities frontier helps us visualize these trade-offs graphically.

THE PRODUCTION POSSIBILITIES FRONTIER

- ◆ The basic concept: when an agent chooses to produce more of Good A, he must produce less of Good B

Purpose

- Illustrates opportunity costs
- Graphs different quantities of two goods that an agent can produce with fixed resources

Shape

- Usually bowed outward
- Can also be linear (see below)

Common Names

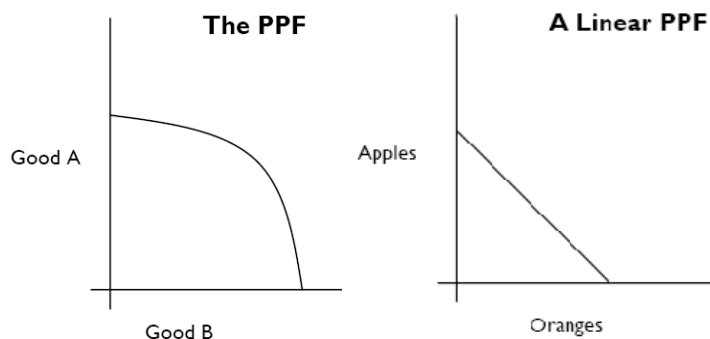
- PPF (Production Possibilities Frontier)
- PPC (Production Possibilities Curve)

What's in a Shape?

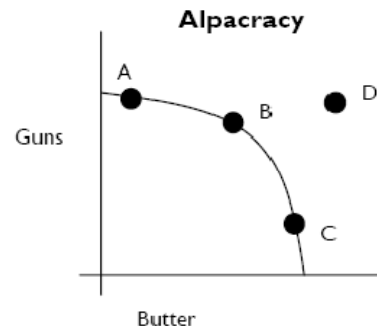
The PPF is usually bowed outward due to the law of increasing opportunity costs. Some resources are better suited to producing one good than another. So when a producer begins to focus extensively on guns, he starts to use resources which typically make butter (like cows). As a result, the producer must expend increasing quantities of resources to produce ever smaller amounts of output.

PPFs, however, are occasionally linear (straight lines). A linear PPF shows that the two goods use identical resources in production.

THE GRAPHS



APPLICATION: A NATION'S PPF



- ◆ Points A, B, and C all represent outputs that are 100% efficient: they are all on the PPF itself
- ◆ Point D is unattainable through production because it is outside the production possibilities frontier; Alpacracy can attain this combination through trade
- ◆ Production at a point inside the PPF indicates a recession in Alpacracy: productive resources are not being utilized to their full extent
- ◆ PPFs can also shift inward or outward

Direction	Meaning	Possible Reasons
Inward	Economic growth	Discovery of resources; new technology
Outward	Reduction in productive capacity	Devastating war; natural disaster

READING REVIEW

QUESTIONS

1. The production possibilities frontier illustrates the concept of _____.
2. An economic agent producing at a point on its production possibilities frontier is experiencing _____.
3. In terms of its production possibilities frontier, a nation experiencing high unemployment is _____.

ANSWERS

1. opportunity cost
2. 100% efficiency
3. producing at a point inside its PPF

FUNDAMENTAL ECONOMIC CONCEPTS

Markets and Trade

MARKETS

VOLUNTARY EXCHANGE

Markets are based on voluntary exchange, in which both parties believe they will be better off as a result of the transaction. Voluntary exchanges allow individuals to specialize in the activity they do best and trade, increasing total societal welfare.

When Do Markets Exist?

Whenever and wherever two or more parties wish to make an exchange

Why Do Markets Exist?

To allow specialization and the division of labor, both of which increase productivity

FEATURES OF MARKETS

- ◆ Formal (established) or informal (underground)
- ◆ Require a means of exchange, such as barter or money

TEST YOUR MARKET MEMORY

QUESTIONS

1. Voluntary exchange takes place in _____.
2. If an economic agent can produce more of a good with fewer inputs than other economic agents, it is said to possess a(n) _____ in producing that good.
3. An economic agent should specialize in the production of a good if it possesses a(n) _____ in producing that good.
4. When a market includes two producers and two products, a producer cannot have a(n) _____ in both products.

ANSWERS

1. markets
2. absolute advantage
3. comparative advantage
4. comparative advantage

TRADE: ABSOLUTE AND COMPARATIVE ADVANTAGE

ABSOLUTE ADVANTAGE

An economic agent has an absolute advantage in a good when it can produce more of that good with fewer or the same amount of inputs than other economic agents.

COMPARATIVE ADVANTAGE

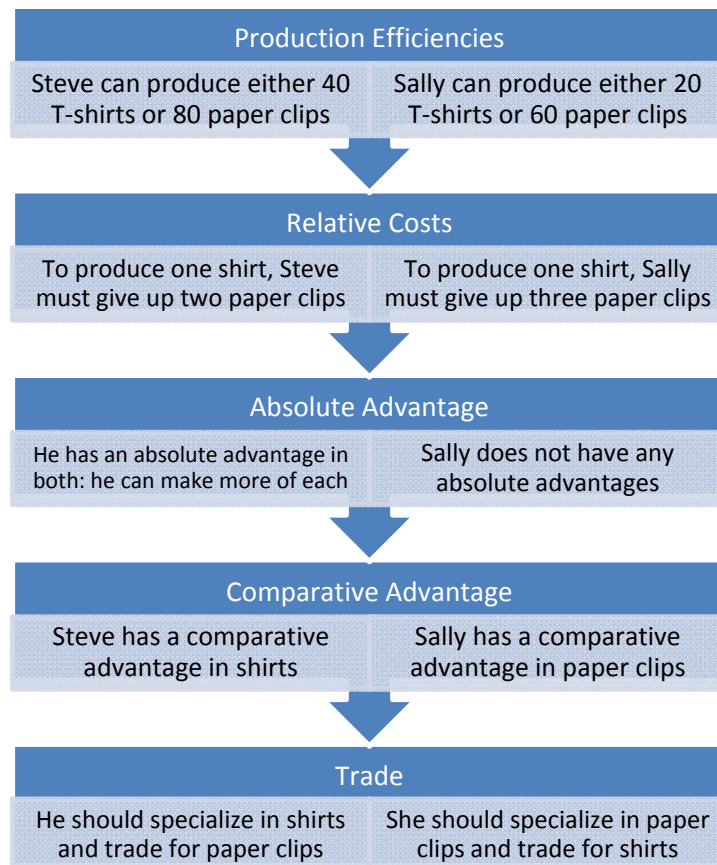
An economic agent has a comparative advantage in a good when it can produce that good at a lower opportunity cost than other economic agents.

- ◆ Comparative advantage was formulated by David Ricardo
- ◆ The theory of comparative advantage states that an economic agent should specialize in the good in which it has a comparative advantage and trade for the other goods

COMPARING THE TWO

- ◆ Even if an agent possesses no absolute advantage in any good, it must possess a comparative advantage in *some* good (but not in *all* goods)
- ◆ Absolute advantage has NO bearing on whether or not two agents should trade

AN EXAMPLE



MICROECONOMICS

Supply

SUPPLY DONE SIMPLE

WHAT IS SUPPLY?

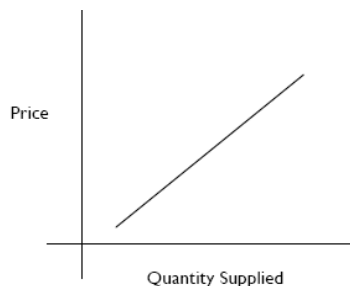
The quantity of a good or service that producers are willing and able to produce at any given price

KEY TERMS

Term	Definition
Law of Supply	As the price of a good increases, quantity supplied increases
Quantity supplied	The amount of a good supplied at a specific price; NOT equivalent to supply
Supply schedule	A table listing the amount of a good producers are willing to supply at every possible price
Supply curve	Graphic representation of a supply schedule; graphed with price on the vertical axis and quantity supplied on the horizontal axis

SUPPLY CURVE

- ◆ Y-axis: price ◆ X-axis: quantity supplied



Caution! Don't confuse a **shift** in the curve with **movement along** the curve.

SHIFT	MOVEMENT
The entire supply curve moves left or right	The curve itself does not move
Quantity supplied changes relative to <i>every</i> price	Quantity supplied changes due to a change in price
Left shift = decrease in <u>supply</u>	Movement left = decrease in <u>quantity supplied</u>
Right shift = increase in <u>supply</u>	Movement right = increase in <u>quantity supplied</u>

FACTORS INFLUENCING SUPPLY

Cost of the factors of production

A decrease in input prices decreases production costs, increasing supply (inverse relationship)

Technological progress

Technological progress decreases the cost of production, increasing supply (direct relationship)

Number of producers

An increase in the number of producers increases supply (direct)

Government regulations

Taxes reduce supply (inverse); subsidies increase it (direct)

Producer expectations

If prices are expected to rise, producers reduce current supply so they can sell at a higher future price (direct)

Remember! A change in price does NOT affect supply, only quantity supplied.

SUPPLY ELASTICITY

$$E = \frac{\% \text{ change in } QS}{\% \text{ change in } P} = \frac{(QS_1 - QS_0) \div QS_0}{(P_1 - P_0) \div P_0}$$

Elastic

- Change in price produces a proportionally larger change in quantity supplied (QS)
- $E > 1$

Inelastic

- Change in price produces a proportionally smaller change in quantity supplied
- $E < 1$

Supply is more elastic in the long run, since firms will be able to plan all their production decisions.

TEST YOURSELF

QUESTIONS

1. How are price and quantity supplied related?
2. A decrease in the cost of flour will have what effect on the supply of cookies?

ANSWERS

1. directly
2. Shift supply of cookies to the right (increase supply)

THE MEXICAN ECONOMY TODAY

ORGANIZATION OF THE ECONOMY AND GOVERNMENT POLICY (1 OF 6)

COMPONENTS OF THE ECONOMY

A DEVELOPING COUNTRY

- ◆ Mexico is a member of the OECD, the Organization for Economic Cooperation and Development
- ◆ Formerly known as the “rich countries’ club,” the OECD now includes several developing countries
- ◆ 2005: Mexico’s population was 105 million with a growth rate of 1.25% (OECD estimate)
- ◆ 2006: Mexico boasts the world’s 14th largest economy

INEQUALITY

- ◆ A large informal sector results from and causes the high level of inequality in Mexico
- ◆ Mexican tax authorities only have records of 20% of the labor force
- ◆ 43% of employment is informal

MANUFACTURING ENTERPRISES

- ◆ Most firms in Mexico are tiny
- ◆ Small firms do not have as much access to credit as larger firms do
- ◆ A few large firms employ the majority of the labor force

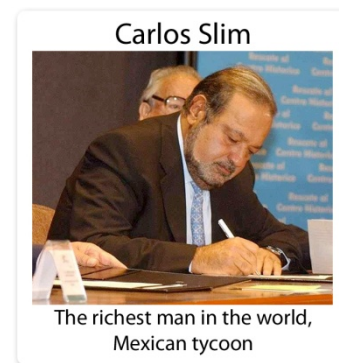
Number of Employees	% of Enterprises	% of Employees
1-9	90.86	18.15
10-49	6.01	10.28
50-249	2.20	19.29
250+	0.93	52.27

THEN AND NOW

Past	Present
Agriculture was Mexico’s main focus	Manufacturing is now gaining more workers
Mexico’s economy was centered around Mexico City (the <i>Distrito Federal</i> , or D.F.)	Mexico City and its surrounding State of Mexico still dominate Mexico’s economy, producing 30% of GDP

EVIDENCE OF INEQUALITY

Who	Carlos Slim
What	Mexican businessman who became the richest man in the world
When	Summer 2007
Effect	His success raised awareness of the need for competition in Mexico and the distribution of reform benefits to everyone



Slim owns the Grupo Carso, a conglomerate that includes the TelMex phone monopoly.

QUICK QUIZ

QUESTIONS

1. What organization was once called the “rich countries’ club”?
2. Mexico’s informal sector accounts for ____% of total employment
3. Another name for Mexico City is the ____.
4. When did Carlos Slim become the richest man in the world?
5. About what percent of Mexican enterprises have 1-9 employees?

ANSWERS

1. The Organization for Economic Cooperation and Development
2. 43
3. *Distrito Federal*, or D.F.
4. Summer of 2007
5. 90%

THE MEXICAN ECONOMY TODAY

ORGANIZATION OF THE ECONOMY AND GOVERNMENT POLICY (2 OF 6)

FINANCIAL ORGANIZATION AND MONETARY AND FOREIGN EXCHANGE POLICY

OVERVIEW

- ◆ The main components of a financial system are banks, various funds, and regulatory institutions
- ◆ Pension and insurance funds invest in short-term money markets and longer-term capital markets
- ◆ Recent economic downturns have led to liberalization
- ◆ As a result, government-owned institutions now have a smaller role in financial markets

THE BANK OF MEXICO

- ◆ Mexico's central bank is *Banco de México*, or Banxico
- ◆ This bank sits at the top of the Mexican financial system

Banco de México

Tries to reduce inflation and create macroeconomic stability

1993: Became independent of government control

Inflation Targeting: Keeps inflation rate within a set range

Adjusts money supply and intervenes in money markets

Still follows the direction of the Finance Ministry

- ◆ In the late '80s and early '90s, Mexico had double- and triple-digit inflation
- ◆ Mexico lowered its inflation with an exchange rate-anchored system
- ◆ The peso currently has a floating exchange rate, but the Finance Ministry does influence it via Banxico

FINANCIAL REGULATORY AGENCIES

1. Banking and Securities Commission (CNBV)
2. Insurance Commission
3. Pension Funds Commission

The Finance Ministry has heavy influence over these agencies. In addition, the agencies lack the proper funding to function well in the economy.

THE BANKING SYSTEM

1982	Mexico nationalizes banks
1991-92	Mexico quickly privatizes banks
1995	Banks collapse after peso crisis

- ◆ Commercial banks located in Mexico provide most of the funds to firms
- ◆ Ironically, Spain, the U.S., Canada, and Britain own most of the Mexican banking system

BANKING ASSETS

Large Foreign Ownership	High Concentration
80% of banking assets belong to foreign powers	60% of banking assets belong to the three largest banks

QUICK QUIZ

QUESTIONS

1. In which year did Banxico become independent?
2. Pension and insurance funds invest in _____ and _____.
3. Banxico uses a policy of _____.
4. What are the three financial regulatory agencies in Mexico?
5. Which four countries own the vast majority of the Mexican banking system?
6. In which year did Mexico nationalize its banks?

ANSWERS

1. 1993
2. money markets and capital markets
3. inflation targeting
4. The Banking and Securities Commission, the Insurance Commission, and the Pension Funds Commission
5. Spain, the United States, Canada, and Britain
6. 1982

MUSIC FUNDAMENTALS

Acoustical Properties of Music – Pitch, Dynamics, Duration, and Timbre

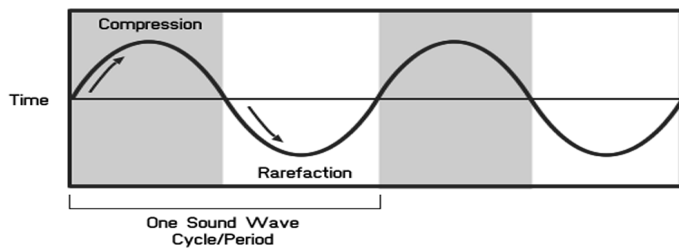
ACOUSTICAL PROPERTIES OF MUSIC

FROM WAVE TO MUSIC

Music is the organized arrangement of sound waves. The acoustical properties of music—pitch, dynamics, duration, and timbre—are related to the properties of the waves.

SOUND WAVE DIAGRAM

Sound is a compression wave that passes through air. Areas of high pressure are called compressions; areas of low pressure are called rarefactions.



PITCH

The frequency of a wave is the number of compressions that pass across a point in space in a certain amount of time. Higher frequencies result in higher sound pitches.

- ◆ Measured in Hertz (Hz)
- ◆ 1 Hz = 1 oscillation per second
- ◆ Pythagoras discovered the mathematical ratio between different pitches

DYNAMICS (VOLUME)

The amplitude of a wave is the extent to which air molecules vibrate. The intensity of a wave is the power of a sound wave. Larger amplitudes and higher intensities result in louder dynamics.

- ◆ Measured in decibels (dB)
- ◆ Bels are logarithmic, meaning that a sound at 20 dB is 10 times louder than a sound at 10 dB
- ◆ Threshold of hearing: 0 dB
- ◆ Threshold of pain: 120 dB

DURATION

The sound envelope describes the lifespan of a sound:

- ◆ Attack: initial resistance to the force of friction
- ◆ Sustain: resonance of expected tone
- ◆ Decay: decrease in amplitude of the sound

TIMBRE

Timbre (TAM-ber), also called “tone color” or “sonority,” describes the sound produced by a voice or instrument.

- ◆ Results from the interference of simultaneously-produced sound waves (harmonics)
- ◆ 1st harmonic = fundamental pitch
- ◆ Each harmonic after the first is an overtone

Several generic sound waveforms exist:

- ◆ Sine: only first harmonic (pure fundamental pitch)
- ◆ Sawtooth: all harmonics
- ◆ Square: all odd harmonics

Beats are pulses that result when two sounds interact (interfere). The frequency of beats equals the difference in frequencies between the two sounds.

DYNAMIC MARKINGS IN MUSIC

Marking	Meaning	Marking	Meaning
<i>pianissimo</i>	very soft	<i>fortissimo</i>	very loud
<i>piano</i>	soft	<i>forte</i>	loud
<i>mezzo piano</i>	medium soft	<i>mezzo forte</i>	medium loud

QUICK REVIEW

QUESTIONS

- What is the threshold of pain?
- What are the three stages of the sound envelope?
- The 3rd harmonic is the ____ overtone.
- _____ distinguishes one instrument from another.
- Square waveforms result from the sounding of ____.

ANSWERS

- 120 dB
- Attack, sustain, and decay
- 2nd
- Timbre
- all odd harmonics

MUSIC FUNDAMENTALS

Formal Properties of Music – Rhythm and Meter

RHYTHM AND METER

SLOW AND STEADY WINS THE RACE

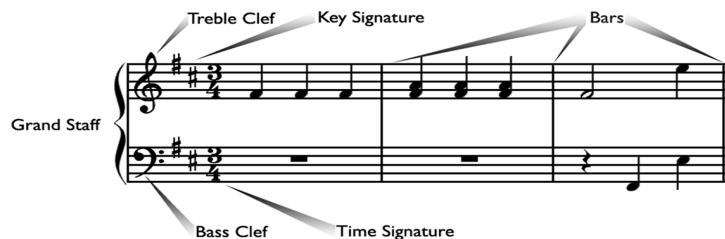
Rhythm and meter provide the structural foundation for musical pieces.

KEY DEFINITIONS

- ♦ **Rhythm:** organization of sounds and silences
- ♦ **Beat:** basic unit of rhythm
- ♦ **Meter:** specific pattern of beats and stresses
- ♦ **Tempo:** speed at which the music plays; measured in beats per minute (metronome marking, or M.M.)

MUSIC NOTATION

Franco of Cologne created the modern Western system of music notation in the 13th century.



- ♦ Measure: groupings of beats; also called bars
- ♦ Bar line: separates one measure from the next
- ♦ Staff: an arrangement of five lines and four spaces
- ♦ Clef sign: denotes the pitches corresponding to a staff
- ♦ Rest: indicates silence
- ♦ Time signature: top number denotes the number of beats in a measure; bottom number denotes which note value counts as one beat
- ♦ Downbeat: the first and strongest beat of a measure
- ♦ Syncopation: technique of accenting beats that would otherwise not be accented

METERS

- ♦ Duple meter: two beats in each cycle (1 2 | 1 2)
- ♦ Triple meter: three beats in each cycle (1 2 3 | 1 2 3)
- ♦ Simple meter: each beat divided in half (1 & 2 & | 1 & 2 &)
- ♦ Compound meter: each beat divided in triplets (1 & a 2 & a | 1 & a 2 & a)
- ♦ Common time: 4/4 time signature (1 2 3 4 | 1 2 3 4)
- ♦ Half time: 2/4 time signature (1 2 | 1 2)

NOTES AND THEIR VALUES

Beats: 1 2 3 4	Beats: 1 2 3 4
Whole Note:	Whole Rest:
Half Notes:	Half Rests:
Quarter Notes:	Quarter Rests:
Eighth Notes:	Eighth Rests:

TEMPO MARKINGS

Marking	Meaning	Metronome Marking (M.M.)
<i>Largo</i>	Very slow	40 – 70
<i>Larghetto</i>	Slightly faster	70 – 100
<i>Adagio</i>	Slow	100 – 128
<i>Andante</i>	Walking pace	128 – 156
<i>Allegro</i>	Fast	156 – 184
<i>Presto</i>	Very fast	184 – 208

Other tempo markings convey mood, such as *grazioso* (gracefully) and *maestoso* (majestically).

QUICK QUIZ

QUESTIONS

1. What is the name for the first beat of a measure?
2. A song in 6/8 time would be in ____ meter.
3. Which tempo marking means “walking speed”?
4. Who created the modern Western notation system?
5. Common time refers to a time signature of ____.

ANSWERS

1. Downbeat
2. compound duple
3. Andante
4. Franco of Cologne
5. 4/4

SECTION II: THE MUSIC OF MEXICO

Pre-Columbian Music – Aztec

AZTEC MUSIC

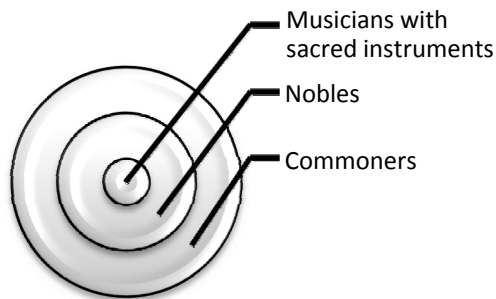
SACRED RITUALS

The Aztecs heavily emphasized religion and expressed their piety through music.

RELIGION, MUSIC, AND DANCE

- ◆ The Aztecs used a religious calendar of 260 days
- ◆ Music and dance only existed in a religious context
- ◆ Musicians enjoyed prestige, but also held serious responsibility for their performances—errors in performance could result in death

Dances followed a very specific arrangement:



AZTEC MUSIC AND INSTRUMENTS

SACRED REPRESENTATIONS OF GODS

<i>Teponaztli</i>	Two-keyed lamellophone Played by striking mallets on two wooden projections from the instrument body
<i>Huéhuetl</i>	Pitched drum Used jaguar or deer skin for the drumhead

OTHER AZTEC PERCUSSION INSTRUMENTS

Formal Name	Instrument Type
<i>Ayacachrli</i>	Rattle
<i>Áyotl</i>	Tortoise shell
<i>Chicahuaztli</i>	Rattle
<i>Chililitli</i>	Cymbal
<i>Omichicahuaztli</i>	Bone rasp
<i>Tetzilácatl</i>	Gong

AZTEC MUSIC (CONTINUED)

AZTEC WIND INSTRUMENTS

<i>Atecocoli</i>	Conch shell trumpet
<i>Huilacapitztli</i>	Ocarina
<i>Tepuzquiquitzli</i>	Trumpet
<i>Tlapitzalli</i>	Flute

- ◆ Spanish colonists later introduced string instruments

AZTEC MUSICAL SYSTEM

- ◆ The Aztecs did not have a written system of notation
- ◆ Spoken syllables helped to choreograph performances
- ◆ The Aztecs preferred high-pitched sounds

Prefix	Meaning	Suffix	Meaning
<i>k-</i>	Downbeat	<i>-i</i>	High pitch
<i>t-</i>	Upbeat	<i>-o</i>	Low pitch

CD TRACK 1:

“COPAL OFFERING TO THE FOUR DIRECTIONS”

- ◆ Educated reenactment by Xavier Quijas Yxayotl
- ◆ He studied the Huicholes and Tepehuanes in Mexico
- ◆ Opens with conch shell trumpets; lacks a steady beat
- ◆ Flutes, drums, rattles, and *teponaztli* then enter

QUICK QUIZ

QUESTIONS

- The *huéhuetl* drumhead used the skins of ____ or ____.
- How many days were in the Aztec religious calendar?
- Which letter signified an upbeat in Aztec music?
- Which instruments can be heard in “Copal Offering to the Four Directions”?
- The *chililitli* was an Aztec ____.

ANSWERS

- deer; jaguars
- 260
- t-
- Conch-shell trumpets, flutes, drums, rattles, *teponaztli*
- cymbal

SECTION II: THE MUSIC OF MEXICO

Pre-Columbian Music – Maya

MAYAN MUSIC

SACRED RITUALS

Mayan music, like Aztec music, existed only in the context of religious ritual.



The Mayan Empire spanned present-day southern Mexico, Guatemala, Belize, El Salvador, and Honduras.

MAYAN MUSIC AND INSTRUMENTS

SUMMARY

- ◆ Music in Mayan society performed the same roles as music in Aztec society
- ◆ Percussion instruments dominated Mayan music

MAYAN INSTRUMENTS AND THEIR AZTEC COUNTERPARTS

Mayan Instrument	Aztec Counterpart	Instrument Type
<i>Tunkel</i>	<i>Teponaztli</i>	Percussion
<i>Pax</i>	<i>Huéhuetl</i>	Percussion

MAYAN MUSIC (CONTINUED)

MAYAN MUSIC AND INSTRUMENTS (CONTINUED)

OTHER PERCUSSION INSTRUMENTS

- ◆ Miniature *pax*
- ◆ Hand drums
- ◆ Turtle shells
- ◆ Rasps
- ◆ Bells
- ◆ Rattles

WIND INSTRUMENTS

- ◆ Wooden trumpets
- ◆ Vertical flutes
- ◆ Multiple-chambered flutes
- ◆ Whistles
- ◆ Conch shells
- ◆ Ocarinas

STRING INSTRUMENTS

As mentioned for the Aztecs, string instruments did not exist in Latin America until the arrival of the Spanish.

QUICK QUIZ

QUESTIONS

1. The Maya called the Aztec *teponaztli* the ____.
2. The *pax* was the Mayan counterpart to the Aztec ____.
3. What were the most common instruments in Mayan music?
4. The Mayan Empire covered part or all of which modern-day countries?

ANSWERS

1. tunkel
2. huéhuetl
3. Percussion instruments
4. Mexico, Guatemala, Belize, El Salvador, and Honduras

SETTING

PLACE	TIME								
<p style="text-align: center;"><u>REGION RECAP</u></p> <p><i>Ultima</i>, set in the eastern plains of New Mexico, features a number of distinct towns and regions.</p> <p>GUADALUPE</p> <p>Tony's family lives on a hill just outside of Guadalupe, which is named after the Virgin of Guadalupe. A track known as the goat path connects the Márez home to the bridge and the town proper.</p> <p>LAS PASTURAS</p> <p>Tony was born in the small plains village of Las Pasturas. Ultima lived here before moving in with the Márez family.</p> <p>EL PUERTO</p> <p>Both the Luna family and the evil Trementinas live in El Puerto.</p> <p>AQUA NEGRA</p> <p>The cursed Téllez family dwells in a settlement on the <i>llano</i> known as Aqua Negra.</p> <p>LOS JAROS</p> <p>The bad neighborhood of Guadalupe, Los Jaros is home to Horse, Bones, Florence, and Abel.</p> <p>DELIA</p> <p>George and Willy, two of Tony's friends, hail from the farm region of Delia.</p> <p style="text-align: center;"><u>GUIDE TO GUADALUPE</u></p> <p style="text-align: center;">Certain establishments in the town play important roles in <i>Bless Me, Ultima</i>.</p> <ul style="list-style-type: none"> ◆ School: one of the town's tallest buildings ◆ Church: one of the town's tallest buildings; site of Tony's catechism lessons and first communion ◆ Rosie's: the local brothel, which Tony's brothers frequent; Tony dreams that Andrew promises not to enter Rosie's until Tony has lost his innocence; Tony later sees Andrew inside Rosie's ◆ Eight Ball: Juan Botas' pool hall; Tony's brothers gamble here at night ◆ Longhorn: the saloon in Guadalupe; Gabriel drinks here on Saturday nights with his <i>vaquero</i> friends ◆ Allen's Food Market: Andrew works here 	<p style="text-align: center;"><u>BACKDROP</u></p> <p><i>Bless Me, Ultima</i> takes place from 1945 to 1947, during and just after World War II. Residents of Guadalupe still feel the impact of war despite their distance from battle.</p> <p style="text-align: center;"><u>EFFECTS OF WAR</u></p> <p style="text-align: center;">Lupito</p> <p>This deranged war veteran kills the sheriff at the beginning of the story</p> <p style="text-align: center;">Mourning Women</p> <p>All of the women in Guadalupe—even those who have not lost loved ones themselves—wear black to church</p> <p style="text-align: center;">Tony's Brothers</p> <p>At the beginning of the story, Andrew, León, and Eugene are away at war; once they return home, they regard small-town life with restlessness and dissatisfaction</p> <p style="text-align: center;">Bomb Test</p> <p>The Manhattan Project, a program to develop a nuclear bomb, was headquartered in Los Alamos; in 1945, an atomic bomb test took place near Alamogordo; the residents of Guadalupe comment that the crafters are challenging God's authority with their powerful creation</p> <tr> <th colspan="2">QUICK QUOTES</th></tr> <tr> <td colspan="2"> <p>"[N]ow the people are scattered, driven like tumbleweeds by the winds of war. The war sucks everything dry." — Gabriel</p> <p>"The war is terrible, the wars have always been terrible. They take the boys away from the fields and orchards where they should be, they give them guns and tell them to kill each other. It is against the will of God." — Prudencio</p> </td></tr> <tr> <th colspan="2">KEY QUESTIONS</th></tr> <tr> <td colspan="2"> <p>QUESTIONS</p> <ol style="list-style-type: none"> With what type of landscape does Gabriel Márez feel most comfortable? What setting do the Lunas favor? <p>ANSWERS</p> <ol style="list-style-type: none"> The open <i>llano</i> (plain) The fertile farmland of El Puerto </td></tr>	QUICK QUOTES		<p>"[N]ow the people are scattered, driven like tumbleweeds by the winds of war. The war sucks everything dry." — Gabriel</p> <p>"The war is terrible, the wars have always been terrible. They take the boys away from the fields and orchards where they should be, they give them guns and tell them to kill each other. It is against the will of God." — Prudencio</p>		KEY QUESTIONS		<p>QUESTIONS</p> <ol style="list-style-type: none"> With what type of landscape does Gabriel Márez feel most comfortable? What setting do the Lunas favor? <p>ANSWERS</p> <ol style="list-style-type: none"> The open <i>llano</i> (plain) The fertile farmland of El Puerto 	
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CHARACTERS

FAMILY

HOUSEHOLD

The characters who live with Tony—especially his parents and Ultima—strongly influence his spiritual development.

ANTONIO (TONY)

- ◆ **Role:** protagonist; a young boy who narrates the story of his spiritual quest
- ◆ **Goal:** to fulfill his parents' dreams and develop his own beliefs

ULTIMA

- ◆ **Role:** Tony's friend and mentor; a *curandera* who comes to live with the Márez family
- ◆ **Goal:** to show people the path of goodness

GABRIEL

- ◆ **Role:** Tony's father; a former vaquero who now works on the highway
- ◆ **Goal:** to move to California and regain the freedom of life on the plains

MARÍA

- ◆ **Role:** Tony's mother; member of the farming Luna family
- ◆ **Goal:** to perpetuate Catholic values in her children and raise Tony to be a Luna farmer-priest

DEBORAH AND THERESA

- ◆ **Role:** Tony's sisters
- ◆ **Goal:** to play with their paper dolls

BIG BROTHERS

Tony's three older brothers are away at war when the story begins. They return home restless and agitated. The brothers sleep during the day and gamble at night. The small-town life of Guadalupe no longer satisfies them.

1. **León:** the oldest brother and the most troubled by nightmares when he returns from war; usually follows Eugene's suggestions
2. **Andrew:** prefers to make his own choices rather than following Eugene; has the most in common with María; originally stays behind when Eugene and León go to Las Vegas; refuses to help Narciso protect Ultima; a customer at Rosie's
3. **Eugene:** the youngest of the set; leads the others; particularly dissatisfied with small-town life

FRIENDS AND FOES

PLAYMATES

Some of Tony's friends, such as Horse and Bones, add comic relief and texture to the story. Other friends play larger roles in Tony's spiritual quest.

Florence

An orphan whose troubled childhood destroyed his belief in God; frequently talks to Tony about spiritual matters

Samuel

A quiet, wise boy who first tells Tony the legend of the golden carp; aspires to be a shepherd

Cico

Shows Narciso's garden and the golden carp's pond to Tony; insists that Tony must choose between Christianity and the golden carp

Vitamin Kid

Likes to race; calls Tony the "giant-killer"

Jasón

Tony's neighbor; visits an Indian against his father's will

Red

A kind and helpful student with red hair; a Protestant who does not believe in witches

LIGHTNING LIST

Tenorio

Antagonist; El Puerto's barber and saloon owner; father of three witches; accuses Ultima of witchcraft; kills Ultima's owl

Lupito

Deranged war veteran; kills the sheriff; the Guadalupe townsmen shoot him

Narciso

The "town drunk"; tries to protect Lupito; keeps a lush garden; wife died of diphtheria; Tenorio kills him

Father Byrnes

The priest in Guadalupe; teaches the catechism; plays favorites; very Joycean

Uncle Pedro

Tony's favorite Luna uncle; afraid to protect Ultima when Tenorio first accuses her; kills Tenorio at the end of the story

Téllez

Friend of Gabriel; a curse on three Indian ghosts plagues his family

PLOT SUMMARY

Chapters 14-15

ESSENTIAL EPISODES

CHRISTMAS PLAY

When the girls in Miss Violet's class do not come to school during a snowstorm, the boys still decide to perform the Christmas pageant. The result is a comical disaster.

Student	Role	Behavior
Red	Narrator	Tries to maintain order
Tony	Joseph	Follows directions
Bones	N/A	Climbs into the rafters and refuses to come down
Horse	Mary	Balks at the idea of playing Mary
Lloyd	Cow	Talks about potential lawsuits; eats Tootsie Rolls
Abel	N/A	Needs to go to the bathroom
Vitamin Kid	King (Incense)	Runs around the stage; knocks off the baby's head
Samuel	King (Myrrh)	Accidentally says "Myra" instead of "myrrh"
Florence	King (Gold)	Taunts Horse

ROSIE'S

Tony is horrified when he follows Narciso to Rosie's and sees Andrew inside. He remembers Andrew's promise in a dream and wonders if he, Tony, has lost his innocence. To make things worse, Andrew refuses to warn Ultima, which allows Tenorio to murder Narciso.

THE WINDMILL

- ◆ León and Eugene return home
- ◆ Gabriel tries to remind his sons how much they used to enjoy working together
- ◆ They built the house on the hill
- ◆ They sometimes worked with him on the highway
- ◆ Nevertheless, the sons refuse to help Gabriel repair the broken windmill
- ◆ Afterwards, all three brothers depart

CRITICAL QUOTES

"Drunks and devils are also men."

– Samuel

"And I remembered my dream. Andrew had said that he would not enter the house of the naked women until I had lost my innocence."

– Tony

"It is good to die on a hill of the llano, beneath the juniper..."

– Narciso

"[T]here's no sense in risking your neck for a hick-town windmill..."

– Eugene

CHAPTER CRUNCH

14. Tony fights to defend Ultima's honor against his classmates' accusations; a snowstorm descends on Guadalupe, and Tony's class performs a disastrous Christmas play; Narciso and Tenorio brawl outside the Longhorn; Narciso warns Andrew at Rosie's that Tenorio is coming for Ultima, but Andrew ignores the warning; Tony watches Tenorio kill Narciso
15. Tony recovers from pneumonia, and León and Eugene return home

QUIZ QUESTIONS

QUESTIONS

1. Which of Tony's classmates accuses Ultima of being a witch?
2. To what does Miss Violet compare the school after the students have left?
3. Why does Tenorio fail to kill Tony?
4. Why did Vigil have to bring home León and Eugene?
5. The three older brothers leave together for _____.

ANSWERS

1. Ernie
2. A tomb
3. When he fires his gun, no bullets come out.
4. They had to burn their crashed car to stay warm.
5. Santa Fe

"THE STRANGER" ("LA EXTRANJERA")

Gabriela Mistral

SELECTION SUMMARY

LONELY LONGING

A war in the subject's homeland forces her into refugee status. She yearns for her native land and keeps her past alive by planting its flora and speaking its language.

THE BASICS

- ◆ **Subject:** female refugee
- ◆ **Speaker:** sympathetic observer
- ◆ **Setting:** desert
- ◆ **Style:** free verse

THEMES

Homesickness

1. Hidden passions
2. Impossibility of assimilation
3. Death

LITERARY DEVICES

- ◆ Alliteration – "speaks...of her savage seas"
- ◆ Simile – "like the face of unknown stars," "fate as a pillow"
- ◆ Metonymy – "speaking a tongue"

GABRIELA MISTRAL'S THEMES

Mistral's poems express passion and emotion. They often convey the pain of loss and suffering, as well as Mistral's preoccupation with death.

Theme	Example	Significance
Children	Lullabies	Mistral could not have children of her own In her poetry, she yearns for the children of others
Tragic events	<i>Sonetos de la Muerte</i> (<i>Sonnets of Death</i>)	An affair led to Mistral's lover's suicide, which inspired this poetry collection
Sympathy for sufferers	"The Stranger"	Mistral commiserated with war refugees over their loss of home and family

ABOUT THE AUTHOR

MISTRAL'S LIFE

- ◆ 1881 – Born Lucila Godoy y Alcayaga in Chile
- ◆ 1922 – Begins to work in Europe; remains there until 1938
- ◆ 1938 – Publishes *Tala*, a poetry book; donates the proceeds to helping homeless Basque children in war-torn Spain
- ◆ 1945 – Becomes the first female Latin American to win the Nobel Prize for Literature
- ◆ 1957 – Dies of cancer

OTHER OCCUPATIONS

Educator

Taught in Chile; studied teaching methods abroad; improved Mexican and Chilean education systems; served as a visiting professor in the U.S.

Diplomat

Worked in various countries as a diplomat for Chile

Activist

Responded to social injustice in Europe

TEST YOURSELF

QUESTIONS

1. Who was the first female Latin American to win the Nobel Prize for Literature?
2. For which nation did Gabriela Mistral serve as a diplomat?
3. Who is the speaker in "The Stranger"?
4. To what is the "fierce, white passion" of the refugee compared?
5. What does the refugee in "The Stranger" plant in the garden?

ANSWERS

1. Gabriela Mistral
2. Chile (her home country)
3. A sympathetic observer
4. The "face of unknown stars"
5. Cactus and alien grass

"UNITED FRUIT CO."

Pablo Neruda

SELECTION SUMMARY	ABOUT THE AUTHOR
<p style="text-align: center;"><u>MAIN IDEA</u></p> <p>North American corporations greedily exploit political unrest in South America. They pilfer valuable resources to pursue profits, with little regard for people.</p> <p style="text-align: center;"><u>IMAGERY ANALYSIS</u></p> <p>Vivid imagery reinforces the speaker's criticism of North American corporations.</p> <p>RELIGION</p> <ul style="list-style-type: none"> ◆ Purpose: to signify corporations' powerful and righteous self-image ◆ Examples: "trumpet blared," "Jehovah," "rebaptized" <p>FRUIT AND FERTILITY</p> <ul style="list-style-type: none"> ◆ Purpose: to illustrate the rich, exploited resources of Latin America; to emphasize the sense of alienation ◆ Examples: "juiciest" regions, "America's sweet waist," "jam," "serving trays," a dead body as "a bunch of lifeless fruit" <p>DEATH AND DESTRUCTION</p> <ul style="list-style-type: none"> ◆ Purpose: to demonstrate the effects of plundering Latin America's resources ◆ Examples: "slumbering corpses," "common graves" <p>FLIES</p> <ul style="list-style-type: none"> ◆ Purpose: to compare dictators to flies; specifically mentions Trujillo, Tacho, Carías, Martínez, and Ubico ◆ Examples: "drunk flies that drone" <p><u>Hint:</u> Consider the fly metaphor in the context of fruit imagery. Like flies, the dictators relish fruit. For the dictators, fruit represents their share in the corporation's profits. Also like flies, the dictators prevent others—the oppressed—from enjoying the benefits of the fruit.</p>	<p style="text-align: center;"><u>TIMELINE</u></p> <ul style="list-style-type: none"> ◆ 1904 – Born Neftali Ricardo Reyes y Basoalto in Parral, Chile ◆ 1924 – Publishes <i>Twenty Love Poems and a Song of Despair</i> ◆ 1927 – Begins to work in the Chilean consular service; continues until 1944 ◆ 1945 – Joins the Communist party as a senator ◆ 1948 – Goes into exile when the Chilean government outlaws Communism; lives in the USSR, Europe, and Mexico ◆ 1950 – Writes the <i>Canto General</i> in Mexico City ◆ 1952 – Chile lifts its ban on Communism; Neruda returns ◆ 1970 – Nominated as a Communist presidential candidate in Chile; declines and supports the eventual victor, Salvador Allende ◆ 1971 – Earns the Nobel Prize for Literature ◆ 1973 – Dies of cancer on Isla Negra, Chile <p style="text-align: center;">FAMILY FACT</p> <p>Pablo Neruda's mother died when he was a baby. He lived with his father, a railroad worker. Later, his father remarried, and Neruda lived with his new stepmother and half-siblings. Perhaps inspired (or tormented) by his family situation, Neruda began to write poems as a teenager.</p>
<p style="text-align: center;"><u>NERUDA'S NOTABLE WORKS</u></p> <ol style="list-style-type: none"> 1. <i>Twenty Love Poems and a Song of Despair</i> – Neruda's first poetry book; translated into 20 languages 2. <i>Canto General</i> – epic poem; Marxist perspective of Latin American history; includes "United Fruit Co." 3. <i>The Elementary Odes</i> – three poetry books about everyday pleasures; written in Neruda's last months 	<p style="text-align: center;">QUIZ QUESTIONS</p> <p>QUESTIONS</p> <ol style="list-style-type: none"> 1. Which literary work contains "United Fruit Co."? 2. What two everyday subjects does an ode in <i>The Elementary Odes</i> address? 3. To what does Neruda metaphorically compare "a bunch of lifeless fruit" in "United Fruit Co."? <p>ANSWERS</p> <ol style="list-style-type: none"> 1. Canto General (an epic poem) 2. Tomatoes and eel stew 3. A dead body

"THE SWITCHMAN"

Juan José Arreola

SELECTION SUMMARY

SWITCHMAN SAYS...

In a dialogue that reads like a two-character play, the switchman of a railroad station tells a traveler about the problems of the train system. This switchman suggests preposterous courses of action for the traveler to take.

STORIES ABOUT THE TRAIN SYSTEM

1. The government's timetables and tickets do not reflect the trains' routes
2. Rails are dilapidated or non-existent; when a train runs out of track, passengers leave the train to form settlements, such as the village of "F."
3. Because of a missing bridge, passengers once dismantled a train and carried the pieces across the gorge
4. Boarding passengers behave violently; to minimize injuries, they receive etiquette instruction and armor
5. Train authorities create fake stations to fool travelers; windows have built-in mirages
6. Conductors abandon passengers at scenic sites

SUGGESTIONS FOR THE TRAVELER

1. Find lodging at the local inn
2. Buy lots of tickets to prepare for any destination
3. Do not talk to the passengers: they may turn you over to the train company's spies
4. Do not leave the train until you see a familiar face

INTERPRETATIONS

- ◆ **Satire** – The story satirizes Mexico's train system
- ◆ **Theatre of the absurd** – The switchman's tales and suggestions become increasingly ridiculous
- ◆ **Social criticism** – Arreola subtly criticizes those in power and the willingness of citizens to acquiesce to their government's absurd actions and demands

Nano-Note

Throughout the story, the passenger emphasizes his need to get to his destination—"T." The use of a letter rather than a specific name generalizes the story and disassociates it from any particular locale. The end of the story features a strange twist: as the train pulls into the station, the switchman asks the passenger to repeat his destination. The traveler replies, "Xi."

ABOUT THE AUTHOR

DATES TO NOTE

- ◆ 1918 – Born in Zapotlán in the Mexican state of Jalisco
- ◆ 1945 – Found the literary magazine *Pan* with Antonio Alatorre
- ◆ 1949 – Publishes *Varia Invención* (a short story collection)
- ◆ 1952 – Publishes *Confabulario* (another short story collection)
- ◆ 1955 – Publishes expanded versions of his short story collections
- ◆ 1962 – Publishes more expanded versions of his short story collections; includes his one-act play "*La Hora de Todos*"
- ◆ 1963 – Publishes his only novel, *La Feria*
- ◆ 2001 – Dies at age 83

CRITICS' COMPLAINTS

Arreola's works usually met criticism. At the time, citizens and critics preferred serious social commentary on Mexican life. Instead of meeting popular demand, Arreola pioneered non-realistic literature. Like writers Franz Kafka and Albert Camus, Arreola sometimes delved into existentialist themes. Such topics went against popular appeal.

TURBO-TEST

QUESTIONS

1. According to the switchman, why do citizens refrain from complaining about the train system?
2. Why do some critics find Arreola's use of the non-realistic mode inappropriate?
3. What happens at the end of "The Switchman"?

ANSWERS

1. Patriotism
2. They feel that the conditions and inequities in Mexico demand more serious and realistic social commentary.
3. The train arrives and the switchman disappears.

COLONIAL ECONOMY

A MIXED ECONOMY

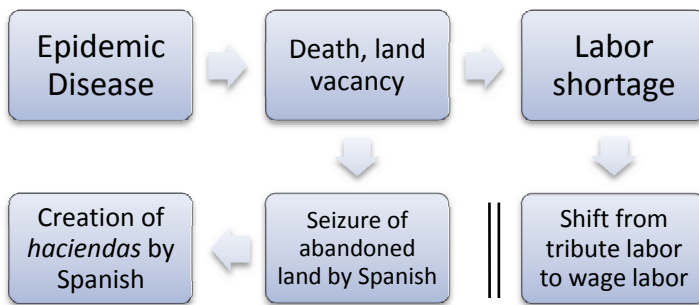
DOUBLE STANDARD

The colonial economy consisted of two sectors:

1. Precious metal mining and other industries that provided wealth for Spain
2. Production of food and utilitarian items that served colonial needs

By 1800, Mexico was Spain's wealthiest and most productive colony.

LAND SURPLUS AND LABOR SHORTAGE



♦ *Hacienda*: mixed agricultural operation

AGRICULTURAL ADVANCEMENTS

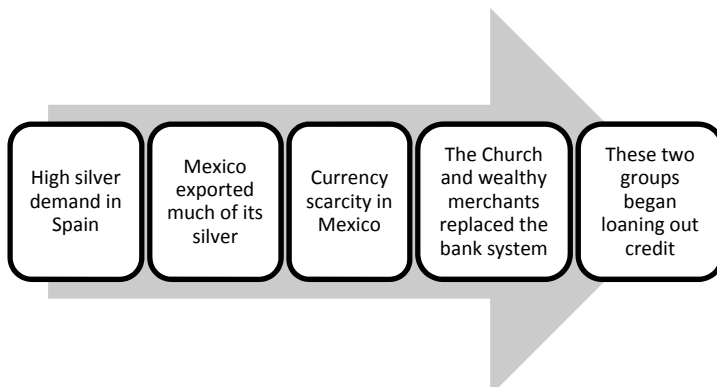
DRAFT ANIMALS

- ♦ Allowed cultivation of more land with less labor
- ♦ Displaced cattle and sheep operations to northern Mexico

CEREAL CROPS

- ♦ Improved diets and food supplies

MONEY SUPPLY ISSUES



SPOTLIGHT: MINING

Mining was the largest segment of the colonial economy, and stimulated other segments as well.

Transportation

Mines were located in high, arid regions far from civilization; they required the transport of supplies, as well as the shipment of the ores produced.

Consumption

Mine workers poured their relatively high wages back into the economy in the form of goods purchases.

Investment

Elites who invested in mining, as well as silver merchants, became very rich. Their wealth rivaled that of the official royal bureaucracy.

Trade

Silver Mexican pesos allowed Mexico to trade with China. Once per year, a fleet crossed from Mexico's port of Acapulco to Manila in the Philippines—which, of course, had access to China.

Silver revenues also provided support for outlying areas of Mexico and for other parts of the empire, such as Cuba.

CREDIT AND LOANS

Who	Merchants and the Church
What	Gave out credit and loans at reasonable rates
Why	To finance food production To finance production of export items such as cochineal (red dye)
How	Debt could carry over between generations

QUICK QUIZ

QUESTIONS

1. What percentage tax did the monarchy impose on mining?
2. When did Spain establish a mint in Mexico City?
3. Name some supplies that had to be transported to mines.

ANSWERS

1. 20%
2. 1535
3. Wool clothes, hides, waterproofing material, draft animals, animal feed

THE CONSTITUTION OF 1812, INDEPENDENCE, AND THE FIRST EMPIRE

GAINING INDEPENDENCE

THE CONSTITUTION OF 1812

During the Morelos Revolt, Spanish Liberals established a central junta and wrote the Constitution of 1812.

TENETS

- ◆ Created a trans-Atlantic commonwealth
- ◆ Expanded civil liberties, including universal male suffrage

Downfall

- Fernando VII returned to the throne in 1814
- He abolished the Constitution of 1812
- He cracked down on independence movements in Latin America, including Morelos's

Resurgence

- In 1820, Liberal army officers revolted
- They reinstated the Constitution of 1812
- Mexicans decided to go their own way

THE PLAN OF IGUALA

Colonel Agustín Iturbide took over Mexico, forming the Plan of Iguala.

THE THREE GUARANTEES

1. Mexico becomes an independent monarchy
2. Catholicism remains the official religion
3. Mexicans and Spaniards are equal

SUCCESS

On September 27, 1821, Iturbide led his army into Mexico City. Independence had come at last, but Mexico would not remain united.

ITURBIDE AS EMPEROR

- ◆ Elevated relatives and supporters to nobility
- ◆ Jailed political dissidents
- ◆ Replaced Congress with an advisory council
- ◆ Used military force liberally

After the Bourbon reforms, Mexican states had little desire for heavy-handed central rule. They also did not want to give up their money and resources to the national government. Thus, Iturbide became increasingly unpopular.

END OF THE EMPIRE

Antonio López de Santa Anna, an army officer, took up the federalist cause. He organized opposition under the Plan of Casa Mata.

Plan of Casa Mata

- Demanded the election of a new Congress
- Supported congressional superiority and regional autonomy
- Did not call for the removal of Iturbide

Iturbide's Response

- Refused to compromise
- Reconvened Congress and abdicated
- Mexico became a republic

SPOTLIGHT: FINDING AN EMPEROR

REJECTION

Plan: Offered Mexico's throne to European ruling houses.

Outcome: Spain refused the crown. Other nations all followed suit and refused the offer in order to avoid upsetting Spain.

PLAN B

Plan: If Mexico couldn't find a European prince, Mexico would choose its own king.

Outcome: Agustín Iturbide assembled his troops. Then, at Iturbide's urging, Congress declared him emperor.

THE LITTLE THINGS

QUESTIONS

1. Which Spanish general defeated Morelos?
2. When was Morelos executed?
3. What was Iturbide's army called?
4. Why did the Plan of Iguala call for a monarchy?
5. What was Iturbide's advisory council called?
6. What garrison did Santa Anna command?

ANSWERS

1. Felix Calleja
2. December 11, 1815
3. Army of the Three Guarantees
4. Republics were seen as unstable and dangerous
5. *Junta Nacional Instituyente*
6. Veracruz

POST-WAR POLITICAL STRUGGLE

RENEWED DEBATE

PARANOIA

After the Mexican-American War, Mexicans were understandably concerned for their nation's sovereignty. Liberals and Conservatives each saw their views as the only way to keep Mexico alive.

THE LIBERAL AGENDA

Main goal: Modernize and strengthen Mexico's economy to resemble the United States'

Rationale: If Mexico and the U.S. are equals, the U.S. will not try to annex Mexico

Major points

- ◆ End Church ownership of land to promote private use of resources
- ◆ End the Church's control over the populace
- ◆ Gain foreign investment

THE CONSERVATIVE AGENDA

Main goal: Make Mexico as different as possible from the United States by asserting traditional values

Rationale: The U.S. will not wish to annex a country culturally incompatible with the U.S.

Major points

- ◆ Keep corporate ownership for its social functions
- ◆ Shun Liberals' materialistic goals

Some Conservatives also suggested installing a monarchy, which could give Mexico connections with powerful European states.

THE RETURN OF SANTA ANNA

In 1853, a Conservative coup overthrew a moderate president and returned Santa Anna to power. With the death of Santa Anna's advisor, Lucas Alamán, the president became autocratic and unpopular.

1853 Mesilla Valley Sale

- Santa Anna sold the Mesilla Valley to the U.S.
- Mexicans were angry after having already lost territory in the war

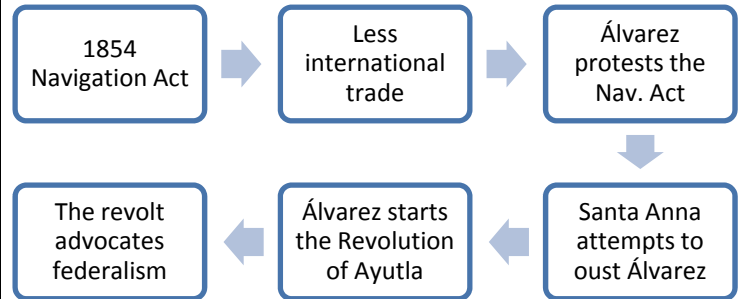
1854 Navigation Act

- Taxed foreign ships entering Mexican ports with goods from a third country
- Decreased trade

THE ÁLVAREZ REVOLT

FEDERALISM

General Juan Álvarez controlled the state of Guerrero and depended on the port of Acapulco for resources.



LIBERALISM

Liberals soon took over the revolt and coined the Plan of Acapulco, which called for:

- ◆ Convening a new Congress
- ◆ Drafting a new, Liberal constitution

In August 1855, Santa Anna left office for exile in Venezuela. The Liberals backed Álvarez, took control of government, and passed a series of reforms:

- ◆ Eliminated the army's special privileges
- ◆ Banned corporate land ownership
- ◆ Ended Church administration of birth records, marriages, cemeteries

QUICK QUIZ

QUESTIONS

1. What intellectual movement inspired Liberal ideas?
2. What did Conservatives think about the issue of economic development?
3. The Mesilla Valley comprises parts of which states?
4. What other trade policies besides the Navigation Act did Santa Anna decree?
5. What did the rebels of the Revolution of Ayutla want?

ANSWERS

1. The Enlightenment
2. They ignored it because they considered social and cultural issues more important
3. Arizona and New Mexico
4. Increased tariffs; arbitrary customs regulations
5. Federalism and the ousting of Santa Anna

MAXIMILIAN'S GOVERNMENT AND THE MEXICAN PEOPLE

A SECOND EMPIRE

MANIPULATING MAXIMILIAN

Abandoning republican ideals, Mexican Conservatives asked Napoleon III to find a king for Mexico. Napoleon chose Maximilian von Habsburg, the younger brother of the Austro-Hungarian Emperor.

THE CONVENTION OF MIRAMAR

- ◆ 1863 meeting between Conservatives and Maximilian
- ◆ Maximilian said he would take the crown if offered it by the Mexican people

A FALSE REFERENDUM

- ◆ Conservatives and the French held a referendum and skewed the results
- ◆ They tricked Maximilian into agreeing to become emperor
- ◆ Napoleon promised Maximilian French military support

THE NEW EMPEROR ARRIVES

Maximilian and his wife, Charlotte, arrived in Mexico in 1864. They tried to connect with their subjects by:

- ◆ Learning Spanish
- ◆ Allowing the public into their palace
- ◆ Introducing fine elements of European civilization to Mexico

Maximilian also refused to be a pawn of France or the Vatican, though he depended on their support:

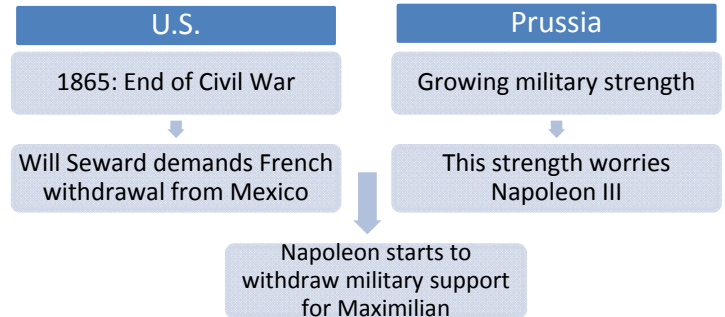
- ◆ He did not concede territory to France
- ◆ He did not negotiate with the papacy on church-state issues

POLITICAL MISUNDERSTANDING

Conservatives were so eager for a monarchy that they didn't bother to check what Maximilian actually believed about political issues. They expected him to overturn Liberal reforms and restore Church properties. Maximilian was in fact more in line with Liberals—but Liberals were none too keen to support a monarchy. Gradually, Maximilian found himself politically trapped.

THE FRENCH WITHDRAWAL

NEW PRESSURES



Maximilian's rule was already jeopardized by ongoing guerilla warfare, so he cracked down—declaring the death penalty for anyone who continued to resist the empire. This move doomed his chances of negotiating with the Liberals. He faced a crisis-level lack of support.

END OF THE EMPIRE

Maximilian's wife traveled to Europe in hopes of renewing support.

- ◆ Pope Pius IX received her but refused his support because Maximilian had not restored Church properties
- ◆ Napoleon III did not receive her

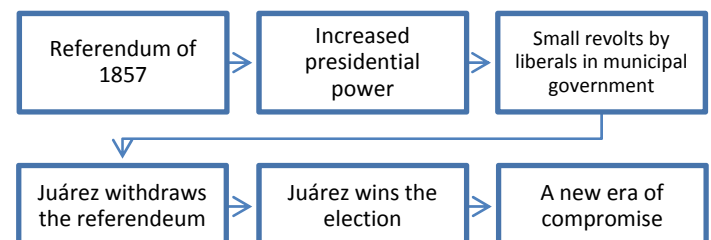
Maximilian's advisors urged him to return to Europe, but he refused. In May 1867, Liberal forces under Juárez captured Maximilian in Querétaro. The Liberal government tried Maximilian and convicted him of treason. He and three of his Mexican generals were executed.

POST-FRENCH POLITICS

Back in control, Benito Juárez sought to avoid future warfare. He released prisoners of war and reconciled with Conservatives who had supported the French.

In 1867, Juárez faced a presidential election. He included a referendum with measures to moderate the Constitution of 1857, including:

- ◆ Allowing the clergy to vote
- ◆ Creating a bicameral legislature



IRT: CONSOLIDATION OF THE PORFIRIATO

PORFIRIAN CHANGES

STABILITY AND ORDER

One of Díaz's major priorities was attracting foreign investment. Western Europe and the U.S. both demanded raw materials, and Díaz was eager to export them. However, to gain foreign trust, Díaz needed stability, not the violence and irresponsibility that had plagued Mexico.

THE PORFIRIAN INTERREGNUM

- ◆ Díaz originally supported no re-election
- ◆ In 1880 he stepped down in favor of Manuel Gonzalez
- ◆ Gonzalez increased the Ministry of Development's budget, allowed investors to purchase vacant land, and created a streamlined federal mining code

DÍAZ'S RETURN

Díaz became president again in 1884. He served as a symbol of stability and order and succeeded in selling this image to foreigners. He promoted strong nationalism and suppressed political dissent in the interest of stability.

ACCOMMODATING THE CHURCH

Díaz's wife, Carmen, helped foster relations with the Church, which prior Liberal governments had neglected.

- ◆ She received the poor on St. Carmen's Day alongside the clergy
- ◆ She organized fundraising to crown the Virgin of Guadalupe

THE ECONOMY

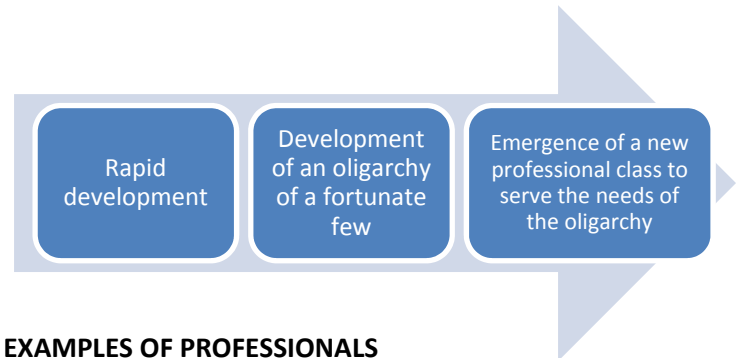
DEBT

One of Díaz's first priorities was to get Mexico out of debt. Early on, Díaz bought up 4 cents on every dollar of Mexican debt. Later, Secretaries of the Treasury refinanced past debts three times.

INDUSTRIES

- ◆ A new federal mining code attracted foreign investment in natural resources
- ◆ New railroads extended into the U.S.
- ◆ Seaports and cities were better maintained
- ◆ Foreign investors drilled for oil in Mexico
- ◆ Agricultural reforms increased commercial agriculture at the expense of subsistence

SOCIAL STRUCTURE



EXAMPLES OF PROFESSIONALS

- ◆ Railroad managers
- ◆ Agricultural technicians

The oligarchy and the professional class were very small. The majority of Mexicans—the rural and urban poor—did not benefit from Porfirian changes.

FACTORS FACING THE POOR

- ◆ Low wages (workers), takeover of agricultural lands (subsistence farmers)
- ◆ Terrible conditions in slums
- ◆ Malnutrition and disease

THE ILLUSION OF STRENGTH

Díaz needed stability to look good to foreign investors, and he used two institutions to work toward this goal.

1. THE OFFICIAL ARMY

- ◆ Replaced volunteer militias
- ◆ Based on politics rather than strategy
- ◆ Kept weak to prevent it from overthrowing Díaz

2. THE RURALES

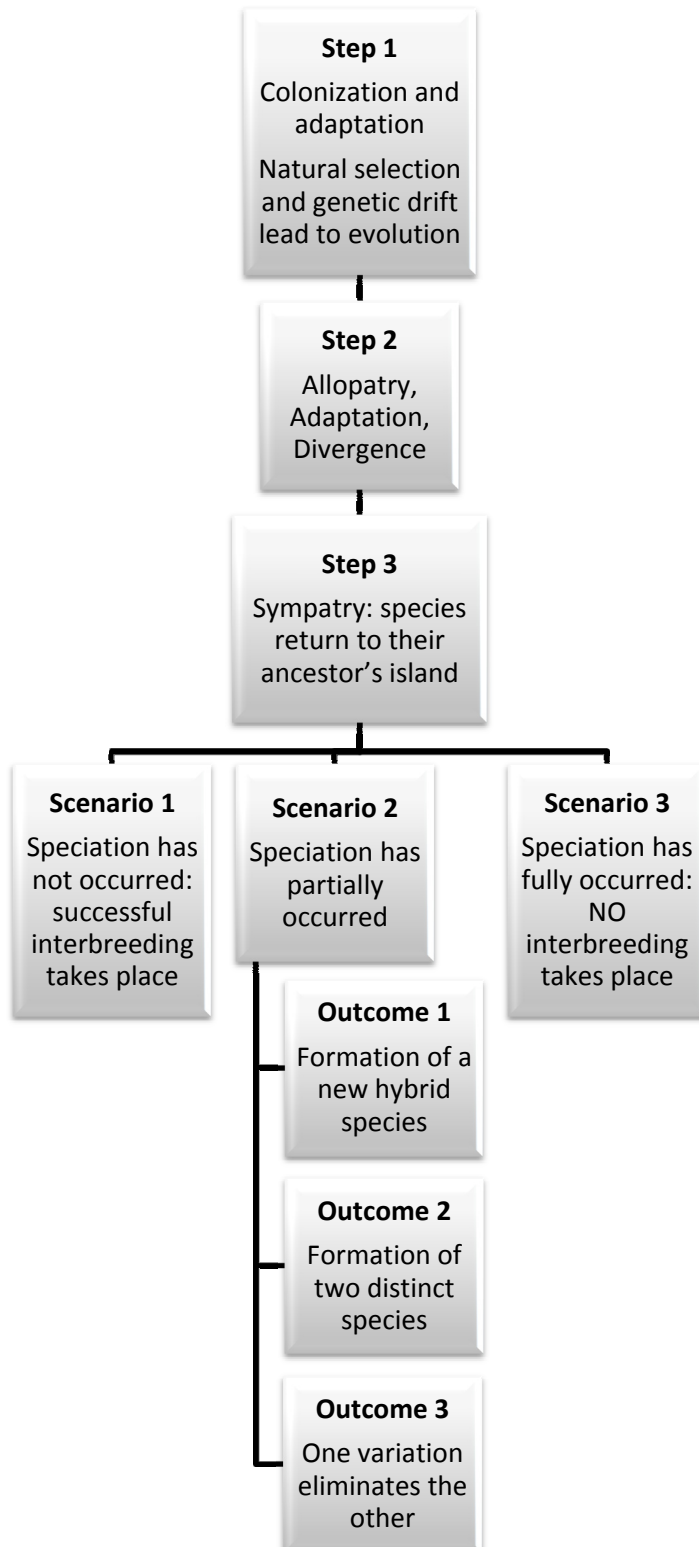
- ◆ Rural police force created by Juárez
- ◆ Enforced laws in a heavy-handed manner
- ◆ Often killed rebels without a trial

LATIN AMERICAN AND EVOLUTIONARY BIOLOGY

Adaptive Radiation of Darwin's Finches (2 of 5)

1981 ALLOPATRIC MODEL OF SPECIATION

Peter and Rosemary Grant's 1981 model of speciation among Galápagos finches:

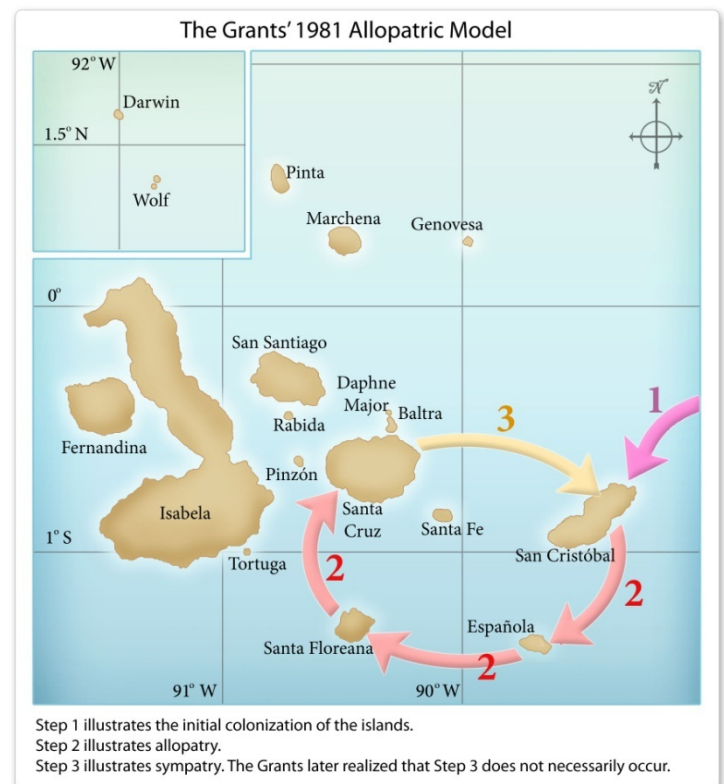


ERRORS OF THE 1981 MODEL

1. Step 3 does not always take place
2. The Galápagos islands actually arose at different times during the last 3 million years

The Grants based their model on the following older islands:

- ◆ San Cristóbal
- ◆ Española
- ◆ Floreana
- ◆ Santa Cruz



REVIEW

QUESTIONS

1. What did the Grants falsely assume in their 1981 allopatric model of speciation?
2. Which four islands does the 1981 model encompass?

ANSWERS

1. 1) Step 3 always takes place
2) The islands have always coexisted
2. San Cristóbal, Española, Floreana, and Santa Cruz

LATIN AMERICAN AND EVOLUTIONARY BIOLOGY

Adaptive Radiation of Darwin's Finches (3 of 5)

DEVELOPMENTS SINCE 1981

SIGNIFICANCE

Since 1981, numerous scientific discoveries have led the Grants to revise their original speciation model.

DEVELOPMENT OF ISLANDS

- ◆ The Galápagos Islands originated in a volcanic hotspot on the northwest region of the archipelago
- ◆ Fernandina currently covers this hotspot

CLIMATIC CHANGES

- ◆ Three million years ago: tropical climate
- ◆ Now: dry, temperate climate

CLIMATIC INFLUENCES

2.8 million years ago Beginning of the most recent Ice Age



Panamanian Isthmus closes, opens,
then closes again

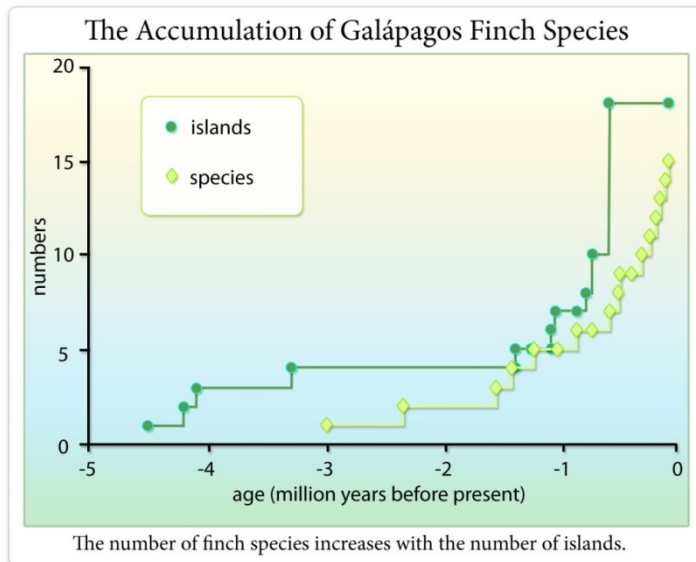


Ocean currents and winds shift

1 million years ago Beginning of variations in
temperature and precipitation

ACCUMULATION OF GALÁPAGOS FINCHES

The Grants compared the development of islands and speciation of finches. Their model does not factor in extinction.



FIELD WORK

DAPHNE MAJOR

The Grants studied the effects of two droughts on the medium ground finch *Geospiza fortis* in Daphne Major.

1977 DROUGHT

1. The drought halted the growth of seed-producing plants
2. *G. fortis* with slightly larger beaks could eat both small and large seeds
3. *G. fortis* with smaller beaks could only eat small seeds
4. By the end of the drought, large-beaked *G. fortis* individuals dominated the population

1987 DROUGHT

1. Once again, the drought prevented seed-producing plants from growing
2. Large-beaked finches first ate large seeds
3. By the time they started to eat small seeds, many large-beaked finches had starved
4. Small-beaked finches dominated the population by the end of the drought

THE THIRD WHEEL

Neither of the droughts significantly affected the cactus finch *Geospiza scandens* because this finch rarely eats seeds.

QUICK QUIZ

QUESTIONS

1. Populations usually remain at a state of _____ equilibrium.
2. The Grants studied the effect of _____ on Daphne Major finch populations.
3. How many years ago did the most recent Ice Age begin?
4. The closure, opening, and reclosure of the _____ allowed the first finches to settle on the Galápagos.

ANSWERS

1. dynamic
2. droughts
3. 2.8 million
4. Panamanian Isthmus

TAXONOMY, CLASSIFICATION, AND SPECIES

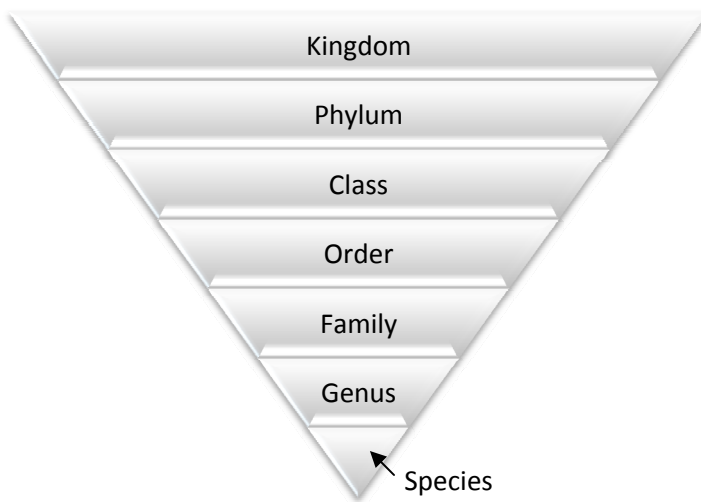
Taxonomy and Classification (1 of 5)

DISTINGUISHING SPECIES

TAXONOMY: A HISTORY

Aristotle	First to propose taxonomy
John Ray	Developed ideas about taxonomy
Carolus Linnaeus	Devised a hierarchical system of classification

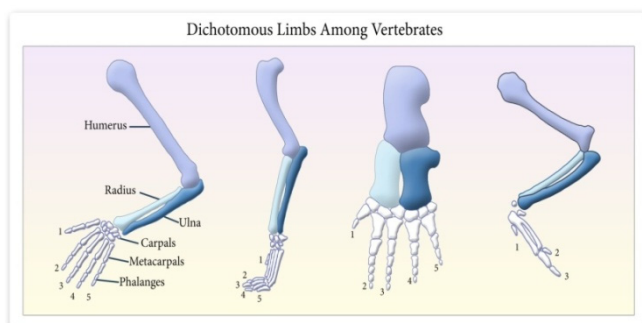
CLASSIFICATION HIERARCHY



HOMOLOGOUS AND ANALOGOUS FEATURES

Homologous Features	Analogous Features
May not superficially resemble each other	Superficially similar
Originate from a common ancestor	Arise from similar environmental conditions

Example of Homologous Features:



DEFINITION OF SPECIES

BIOLOGICAL SPECIES CONCEPT

DEFINITION

Species: a set of organisms that can successfully interbreed

OBJECTIONS

Microbiologists	Single-celled organisms such as bacteria do not sexually reproduce
Botanists	Different plant species can hybridize <i>Leucobalanus</i> oaks often breed across different species
Practicality	Scientists cannot test for reproductive isolation in millions of species

Solution

Biologists accept the biological species concept in theory but not in practice

UNIVERSALITY OF SPECIES

Western and folk taxonomical systems define species in very similar ways. For example, Ernst Mayr identified 137 mountainous New Guinean birds; folk taxonomy identifies 136 species.

REVIEW QUESTIONS

QUESTIONS

- Who was the first to propose taxonomy?
- Why do microbiologists object to the biological species concept?
- Why do botanists object to the biological species concept?
- List the taxa of Linnaeus's classification system, from most inclusive to most specific.
- Analogous features (do/do not) originate from a common ancestor.

ANSWERS

- Aristotle
- It does not address asexual reproduction.
- It does not address interspecific hybridization (mating across different species).
- Kingdom, phylum, class, order, family, genus, species
- Do not

TAXONOMY, CLASSIFICATION, AND SPECIES

Taxonomy and Classification (4 of 5)

CLADISTIC CLASSIFICATION

THREE-SECOND BRIEFING

Willi Hennig developed cladistic classification in the 1950s as an alternative to the subjective system of traditional classification.

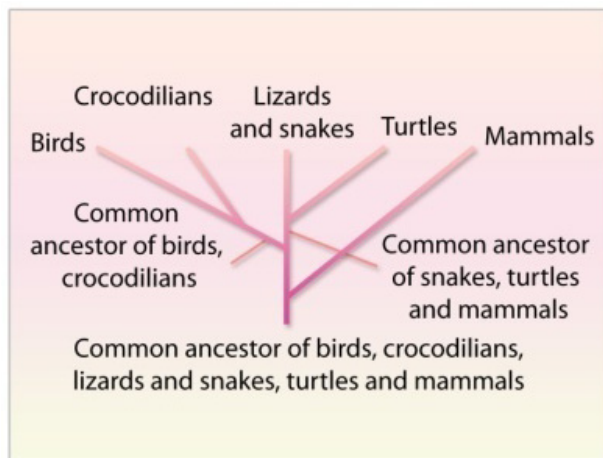
Other names: cladistics, phylogenetic systematics

GUIDELINES

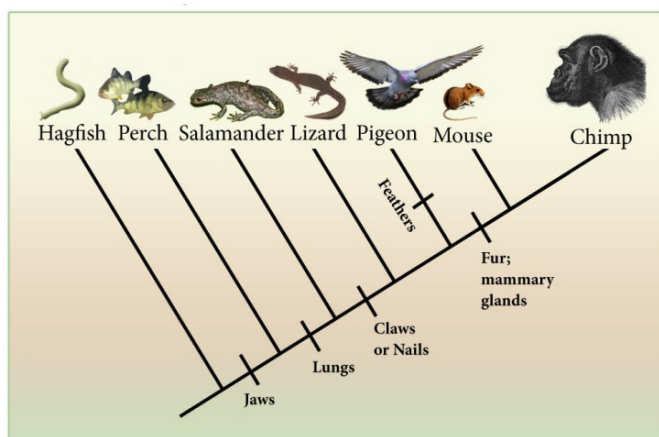
- ◆ Unlike traditional classification, cladistics only deals with derived characters
- ◆ Prior to classifying species, cladistic taxonomists isolate ancestral species into outgroups
- ◆ By isolating outgroups, cladistic taxonomists omit primitive characters from their analyses

CLADOGRAMS

Cladogram of Reptiles, Birds, and Mammals



Cladogram of Vertebrate Chordates



APPLICATION: HUMANS, CATS, AND SEALS

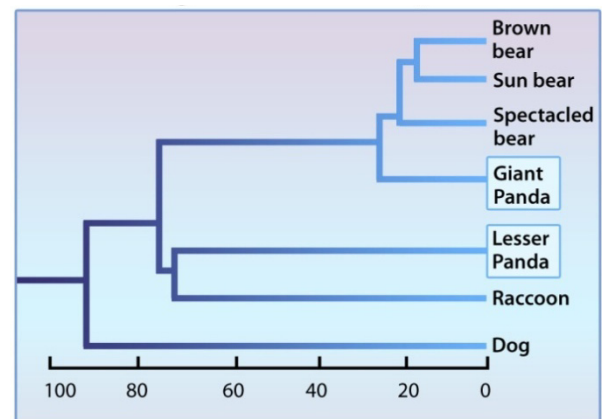
Cladistic Classification	Traditional Classification
Step 1 <i>Identify the outgroup</i> Mammalian ancestor with five digits on each limb	Step 1 <i>Analyze shared primitive characters</i> Amniotic egg
Step 2 <i>Classify species based on derived characters</i> Cats and seals both belong to the order Carnivora Humans belong to the order Primata	Step 2 <i>Analyze derived characters</i> Seals have flippers while cats have claws—thus, they belong to different clades

Notice that cladistic taxonomists do not take note of seal flippers and cat claws since these structures evolved from a common ancestor in the outgroup.

APPLICATION: PANDAS

Cladistics reveals that giant pandas and lesser pandas (red pandas) are closely related to raccoons.

Cladogram of Panda Species



DISADVANTAGES

- ◆ Cladistics only maps divergence
- ◆ It cannot depict hybridization (convergence)
- ◆ When two species create a new species, derived characters can become primitive characters
- ◆ W.H. Wagner suggests reticulistics to accommodate both convergence and divergence
- ◆ No mathematical algorithm yet exists for reticulistics

EVOLUTIONARY MECHANISMS AND GENETIC DIVERSITY

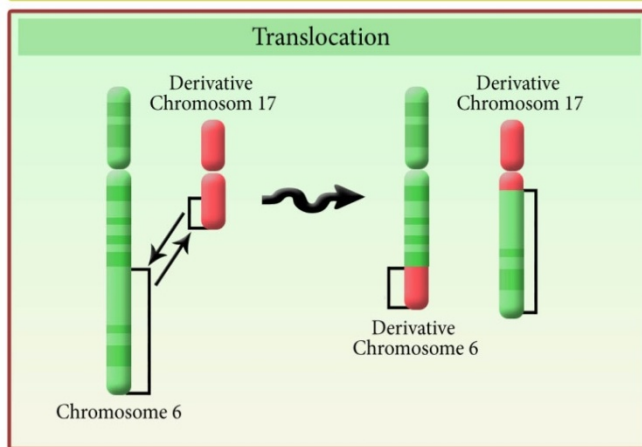
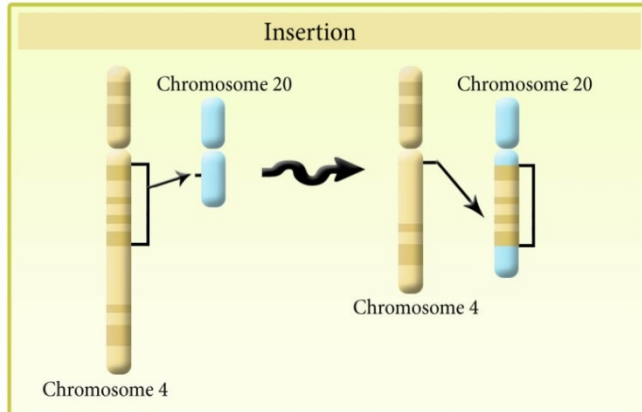
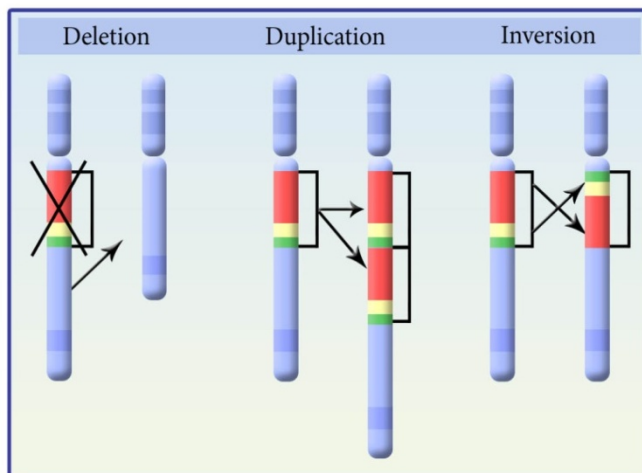
Introduction to Evolutionary Biology (2 of 2)

INCREASING GENETIC VARIATION

MUTATION

Mutations take place on two levels: chromosomal and molecular.

Chromosomal Mutations



MUTATION (CONTINUED)

MOLECULAR MUTATIONS

- ◆ Point mutations
- ◆ Frame shifts
- ◆ Regulatory defects

POINT MUTATIONS

Nonsense mutation	Prematurely ends protein synthesis
Missense mutation	Replaces one amino acid with another
Silent mutation	Causes an undetectable change

GENE FLOW

Migration of individuals to a new population

- ◆ Increases genetic variation of the new population
- ◆ Usually does not decrease variation in the original population

STUDY QUESTIONS

QUESTIONS

1. Name the five chromosomal mutations.
2. Name the three molecular mutations.
3. Describe the effects of the three point mutations.
4. True/False: Gene flow increases genetic variation in the new population but decreases genetic variation in the original population.

ANSWERS

1. Deletion, duplication, inversion, insertion, translocation
2. Point mutations, frame shifts, regulatory defects
3. Nonsense mutation: prematurely ends protein synthesis;
Missense mutation: replaces one amino acid with another;
Silent mutation: undetectably changes a protein
4. F (almost always)

EVOLUTIONARY MECHANISMS AND GENETIC DIVERSITY

Introduction to Evolutionary Biology (4 of 14)

NATURAL SELECTION

OVERVIEW

Natural selection is a type of “jury-rigged” selection, since nature predetermines the range of possible evolutionary outcomes. In addition, natural selection does not act with foresight—it only manipulates variations that already exist.

ADAPTIVE RADIATION

Of the five evolutionary mechanisms, only natural selection leads to adaptive radiation.

DECREASING GENETIC VARIATION

Natural selection most commonly decreases genetic variation

“Evolution proceeds in spite of natural selection.”

– **George Williams**

BALANCING SELECTION

- ◆ Maintains genetic variation
- ◆ Takes place when heterozygotes are more fit than homozygotes
- ◆ Rarely occurs

Application: Sickle-Cell Anemia

Sickle-cell anemia is a congenital disease.
A = dominant allele; a = recessive allele

Genotype	Sickle-cell Anemia?	Malaria Resistance?
AA		
aa	X	X
Aa		X

Thus, heterozygotes are the most fit since they do not have the disease but do develop resistance to malaria.

In patients with sickle-cell anemia, abnormal strand-forming hemoglobin distends red blood cells so that the cells clot and cannot efficiently carry oxygen.

POSITIVE SELECTION

Increases the frequency of beneficial traits; also known as positive Darwinian selection

SELFISHNESS

Acting to increase one's own inclusive fitness

Direct fitness

Number of alleles that an organism contributes to the next generation;
example of increase: eating lunch

Indirect fitness

Number of others' alleles identical to its own that an organism helps to contribute to the next generation;
example of increase: helping a sibling

Inclusive fitness

Direct fitness + Indirect fitness

Reciprocal altruism

Two organisms which cooperate to increase their own reproductive fitness

- ◆ Natural selection favors selfishness
- ◆ Vampire bats exhibit reciprocal altruism: they share their meals with other hungry bats
- ◆ J.B.S. Haldane joked that he would drown to save two siblings or eight cousins
- ◆ Eusocial organisms, such as ants, particularly focus on increasing their indirect fitness

POP QUIZ

QUESTIONS

1. Which genotype results in malaria resistance but not sickle-cell anemia?
2. Natural selection is a type of “_____” selection.
3. According to George Williams, “Evolution proceeds in spite of _____.”
4. Contrast direct fitness and indirect fitness.

ANSWERS

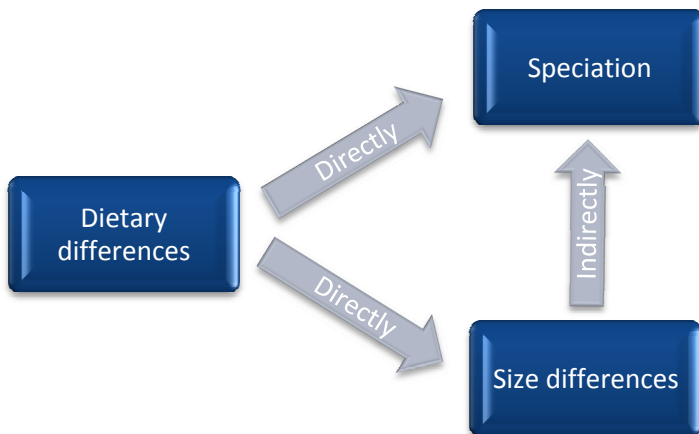
1. Aa
2. jury-rigged
3. natural selection
4. Direct fitness refers to an organism's success in contributing alleles to the next generation through reproduction. Indirect fitness refers to the number of alleles identical to its own that an organism passes to the next generation by helping others, such as siblings.

EVOLUTIONARY MECHANISMS AND GENETIC DIVERSITY

On the Many Origins of Species (3 of 3)

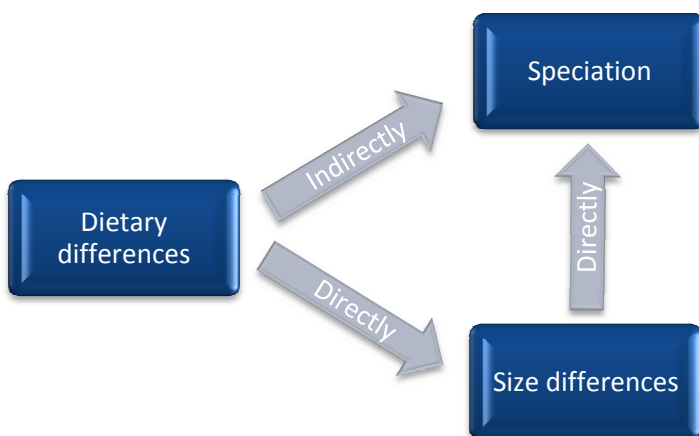
CICHLIDS AND STICKLEBACKS

SYMPATRY OF CICHLIDS



SYMPATRY OF STICKLEBACKS

Dolph Schluter and Eric Taylor investigated sympatric speciation among sticklebacks. These fish live in Canadian lakes carved out by glaciers 13,000 years ago. Schluter previously questioned sympatric speciation but now admits that it takes place.



Other Examples of Sympatry

Ermine moths
Heliconius butterflies
 Aphids
 Sockeye salmon
 Sea urchins

OPINION: SYMPATRIC SPECIATION

Scientist	Belief
William Rice	Believes that sympatric speciation rarely takes place Possible scenarios for sympatric speciation: 5. Mass extinction 6. Evolution of a new plant 7. Formation of a new lake
Ernst Mayr	Sympatry weakly separates species Sympatric speciation only produces 1% of all new species
John Endler	Scientists no longer need to ask <i>whether</i> sympatric speciation occurs Rather, they must research <i>how often</i> and <i>why</i> it takes place

ALLOPATRY IN THE AMAZON

GEOGRAPHY

The Amazon, Negro, and Madeira Rivers enclose the Amazon River Basin.

JAMES L. PATTON'S RESEARCH

- ◆ Studied 52 mammals, including tamarins, rodents, and marsupials, along Rio Juruá
- ◆ Calculated when each species evolved by analyzing their mtDNA
- ◆ 11 of 17 rodents and marsupials diverged along a no longer visible Iquitos arch that lies perpendicular to Rio Juruá

QUIZ BREAK

QUESTIONS

1. Which three rivers enclose the Amazon River Basin?
2. Among sticklebacks, dietary differences (directly/indirectly) lead to speciation.

ANSWERS

1. Amazon, Negro, Madeira
2. indirectly

SELECT TOPICS IN EVOLUTIONARY BIOLOGY

Evolution and Tinkering (2 of 5)

SCIENTIFIC HIERARCHY

SCIENTIFIC FIELDS

Psychosociology is a special case of biology, which is a special case of chemistry, which is a special case of physics.
All that is true for “simpler” fields is also true for “complex” fields.

Physics	Chemistry	Biology	Psychosociology
Increasing Complexity ----->			
Decreasing Age ----->			
Increasing Empirical Evidence ----->			
Harder system of hypotheses & experimentation		Softer system of hypotheses & experimentation	
Fewer limitations		More limitations	

REDUCTIONISM

- ◆ **Definition:** explaining complex concepts with simpler concepts
- ◆ **Example:** explaining biology with physics

LIMITS

Two major events led to evolution:

1. The origin of life
2. The emergence of thought and language

However, these two events cannot explain such complex resultant events as justice and democracy.

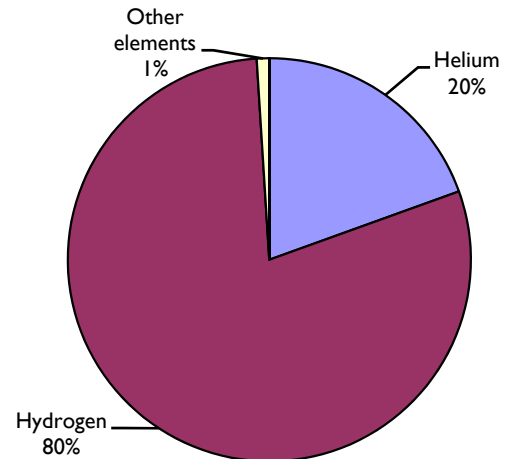
APPLICABILITY

- ◆ Molecular biologists developed understanding of inheritance by examining the simplest components of life
- ◆ For example, they researched bacteria—the black box of molecular biology
- ◆ Scientists strive to understand the additional restrictions at each level

DEVELOPMENT OF COMPLEXITY

1. Constraints at each level
2. History of interactions among different levels of complexity

COMPOSITION OF ALL MATTER (BY MASS)



QUICK QUIZ

QUESTIONS

1. Hydrogen comprises about __% of the mass of all matter.
2. True/False: As scientific fields increase in complexity, limitations also increase.
3. Reductionism refers to the explanation of concepts based on their _____.
4. Which two major events led to evolution?
5. What is the black box of molecular biology?
6. What two factors guide the development of complexity?
7. True/False: Biology has a softer system of hypotheses than psychosociology.

ANSWERS

1. 80
2. True
3. complexity
4. The origin of life and the emergence of thought and language
5. The bacterium
6. Constraints at each level and the history of interactions among different levels of complexity
7. False

CRUNCH KIT

Bless Me, Ultima in Three Pages (Page 1)

INTRODUCTION

- *Bless Me, Ultima* is not considered Latin American literature under its usual definition
- *Ultima* was written in English rather than in a Romance language

AUTHOR BACKGROUND

- Rudolfo Anaya was born in Pastura, New Mexico
- He attended high school and the University of New Mexico in Albuquerque
- Anaya earned a Bachelor's degree in English and a Master's degree in counseling
- *Bless Me, Ultima* is Anaya's first novel
- *Ultima* draws heavily on Anaya's own experiences
- It earned the Premio Quinto Sol in 1971
- *Ultima* is part of a trilogy that also includes *Heart of Aztlán* and *Tortuga*

NEW MEXICO HISTORY

- Explorers came to the New Mexico area looking for the Seven Cities of Gold
- In 1540, Francisco Vázquez de Coronado discovered a Zuni Pueblo in modern-day New Mexico
- In 1680, the Pueblo Indians revolted against the cultural domination of the Spanish
- 1,000 Spanish settlers fled south to Mexico
- They eventually returned and regained control of Santa Fe
- Mexico gained independence from Spain in 1821
- Colonel Stephen Watts Kearney took possession of New Mexico for the United States in 1846
- New Mexico became a state in 1912

SETTING

- **Place:** eastern plains of New Mexico
- **Time:** end of World War II (1945-47)
- **Local towns:** Guadalupe, Las Pasturas, El Puerto, Los Jaros, Aqua Negra, Delia
- **Signs of the times:** Manhattan Project (Los Alamos), bomb test (Alamogordo), deranged veteran (Lupito)

ULTIMA

- A *curandera* from Las Pasturas
- Moves into the Márez house
- Learned her trade from the "flying man," a Native American
- Addressed politely as "*la Grande*"
- Cures Uncle Lucas and the Téllez family of their curses
- Tenorio accuses her of being a witch
- Keeps an owl, which embodies her soul
- Tony's friend and mentor

ANTONIO "TONY" MÁREZ

- Narrator and protagonist
- Six years old when the story begins
- Middle name, "Juan," bears connotations of healing
- Becomes close friends with Ultima; helps her cure Lucas and lift the Téllez family's curse
- Struggles with the conflicting dreams and expectations of his parents

GABRIEL MÁREZ

- Tony's father
- Former vaquero who longs for the open plains of his youth
- Works on the railroad
- Dreams of moving to California with his sons

MARÍA LUNA Y MÁREZ

- Tony's mother
- Ardent Catholic
- Member of the Luna family of farmers from El Puerto
- Dreams that Tony will become a priest

LEÓN, ANDREW, AND EUGENE MÁREZ

- Tony's older brothers
- Initially away at war
- Patrons of Rosie's and the Eight Ball
- Eugene, the youngest, often leads; León, the oldest, follows
- Andrew prefers to make his own decisions
- Andrew stays behind when León and Eugene go to Las Vegas
- He refuses to help Narciso warn Ultima when Tenorio is coming to get her
- Andrew later leaves with León and Eugene when they decide to travel to Santa Fe

DEBORAH AND THERESA MÁREZ

- Tony's older sisters
- Play with paper dolls in their room
- Deborah has many Márez traits
- She also likes to speak English

TENORIO TREMENTINA

- The novel's main villain
- Barber and saloon owner in El Puerto
- His daughters lay curses on Lucas and the Téllez family's resident Indian ghosts
- Accuses Ultima of witchcraft
- Kills Narciso and shoots Ultima's owl

CRUNCH KIT

Latin American Art in Two Pages (Page 2)

CIVILIZATIONS – TEOTIHUACÁN

- Translates to “the place of the gods”; deities sacrificed themselves here to create the world
- Post-Classic Aztecs revered this city, made many pilgrimages here; written records offer scholars clues about the city
- Located 40 kilometers outside of Mexico City; surrounded by hills; covered eight square miles; grid layout
- Avenue of the Dead includes Pyramid of the Moon, Pyramid of the Sun, Temple of Quetzalcoatl, and *Ciudadela*
- *Talud-tablero* motif: sloping walls alternating with flat panels
- Fresco artworks are everywhere in the city; famous for cylindrical tripod vase with fitted lid

CIVILIZATIONS – CLASSIC VERACRUZ

- Emerged during Preclassic Period; also known as Totonecs
- El Tajín featured pyramids, palaces, and 17 ball courts
- *Palmas*: sculptures that fit into ceremonial belt
- *Hachas*: thin axes with relief carvings

CIVILIZATIONS – THE MAYA

- Emerged during Preclassic Period; thrived during Classic Period; endured to Post-Classic Period; 7.5 million people of Maya descent
- Included Guatemala, Belize, Honduras, and El Salvador
- Artworks depict bloodletting and auto-sacrifice
- Ate squash, chile peppers, maize, and beans
- Territory contained limestone, obsidian, and salt beds
- Religion: caves had special significance for Maya; reciprocal relationship with gods; cyclical nature of time; ballgames
- Used bark-paper codices, Long Count, Neolithic technology, polychromed vessels

CIVILIZATIONS – THE TOLTECS

- Occupied Tula from A.D. 900 to 1200
- “Toltec” means “makers of things” or “craftsman”
- Quetzalcoatl gave knowledge, art, and literature to the Toltecs; the Aztecs borrowed this god for their religion
- Artists created stone warriors and relief sculptures

CIVILIZATIONS – THE AZTECS

- Emerged as a nomadic group in the 12th century; by 1435 became the premier power in central valley of Mexico
- Also known as Mexica; originated from Aztlan
- Tenochtitlán sat on Lake Texcoco; farmers created *chinampas* (raised fields)
- Tenochtitlán had 150,000-200,000 at its peak; Coatpantli (“Snake Wall”) surrounded the Sacred Precinct
- Belonged to Triple Alliance with Texcoco and Tlacopan
- Displayed *tzompantli* (skull racks) at capital city

SELECTED ARTWORKS – PRE-HISPANIC ART

- *Olmec Figure Sitting*: Olmec; low-fire earthenware
- *Standing Female, Michoacán*: ceramic; burial item in Chupícuaro, Guanajuato; scarification; shorter and fatter
- *Standing Female, Jalisco*: ceramic; stylized belt covers groin; taller and thinner; necklace with one bead
- *Pyramid of the Sun*: Teotihuacán; cave 300 feet beneath; largest pyramid in Mesoamerica
- *Smiling Head*: Veracruz; ceramic; Remojadas style; smile related to ritual death or ancestors
- *Beaker*: Maya; polychrome ceramic; coil method; smoke means speech; hieroglyphs; similar to wall paintings
- *Temple of the Giant Jaguar*: Maya; Temple I; Tikal; cut stone masonry; tomb of Jasaw Chan K’awiil; roofcomb on top
- *Mosaic Skull and Jaw*: Aztec; turquoise dominant color; rose-band beneath nose; white tiles for eyes

SELECTED ARTWORKS – ART OF THE COLONIAL ERA

- *Codex Huejotzingo*: Nahuatl; *maguey* paper; banner of Virgin Mary and Christ; used in trial against Nuño de Guzmán
- *Untitled (Our Lady of Guadalupe)*: Francisco Agüera Bustamante; engraving; resembles Virgin of the Apocalypse
- *Don Juan Joaquín*: Miguel Cabrera; oil on canvas; *cartouche* contains titles; similar to *Louis XIV* by Hyacinthe Rigaud
- *From Spaniard and Black, Mulatto*: José de Alcázar; oil on canvas; *casta* painting; features *banyan* and *indianilla*
- *Shawl*: silk plain weave; reversible embroidery; similar to a *casta* painting; intended for a rich woman
- *Metropolitan Cathedral*: Claudio de Arciniega (main architect); constructed for 200+ years; Solomonic columns; baroque, neoclassical, Renaissance, rococo styles

SELECTED ARTWORKS – ART AFTER INDEPENDENCE

- *Valley of Oaxaca*: José María Velasco; oil on canvas; Catholic cross on hill; atmospheric and linear perspective
- *La Calavera Catrina*: José Guadalupe Posada; relief etching on zinc; *corrido* text beneath skull; “catrin” is a pun on “dandy”; popularized by Diego Rivera’s *Alameda Park*
- *The Flower Carrier*: Diego Rivera; oil and tempera on Masonite; painted for Albert M. Bender; idealized peasants
- *Frieda and Diego Rivera*: Frida Kahlo; oil on canvas; resembles *The Arnolfini Portrait* by Jan Van Eyck
- *Figure in Illuminated Doorway*: Rufino Tamayo; color lithograph; keyhole-shaped head; lozenges decoration
- *The National Palace*: known as Viceregal Palace and Presidential Palace; built by Martín Cortéz; three stories tall (enlarged from two)
- *The History of Mexico*: National Palace; scenes—*The Aztec World, From Conquest to the Present, Mexico Today and Tomorrow*; Karl Marx leads toward utopia

CRUNCH KIT

List of Lists

9 HIGH PRIORITY PEOPLE		ARCHITECTURE	
Alcíbar, José de	Co-founder and director of the Royal Academy of San Carlos; student of Miguel Cabrera	Castle of Chapultepec	Battle site during the Mexican-American War; six young Mexican cadets made their last stand here against American forces
Arciniega, Claudio de	Conceived Metropolitan Cathedral's original design c. 1569	<i>Ciudadela</i>	A building two miles south of the Pyramid of the Moon
Bustamante, Francisco Agüera	Engraver; one of the few allowed to examine the Virgin of Guadalupe image firsthand	<i>Coatepantli</i>	Snake Wall; surrounds Sacred Precinct
Cabrera, Miguel	Zapotec artist; in 1751, he produced a copy of the miraculous Virgin of Guadalupe image	Constitution Square	Mexico City's <i>zócalo</i>
Cuahtlatotzin, Juan Diego	Aztec man and Catholic convert who witnessed the image of the Virgin Mary in December 1531	Great Temple	Honored the god Huitzilopochtli; lies beneath the present-day Metropolitan Cathedral
Pope Benedict XIV	Issued a Papal Bull; designated the Virgin of Guadalupe as patroness of New Spain	Pyramid of the Moon	Pyramid in Teotihuacán; imitates Cerro Gordo shape
Posada, José Guadalupe	Published his work on broadsheets and in newspapers; famous for his <i>calavera</i> (skeleton) images	RCA Building	Diego Rivera painted <i>Man at the Crossroads</i> here; controversial mural of Lenin
Rivera, Diego	One of the "three big ones"; co-founder of the Union of Technical Workers, Painters, and Sculptors	<i>Sagrario Metropolitano</i>	Parish church in the Metropolitan Cathedral
Zumárraga, Juan de	Spanish bishop; Juan Diego conferred with him after seeing the Virgin of Guadalupe	St. Peter's Cathedral	Popularized the Solomonic columns during the baroque period
		Temple of Quetzalcoatl	At the southern end of the Avenue of the Dead; features a <i>talud-tablero</i> façade with relief decorations
		Temple of Solomon	Original building featuring Solomonic columns
12 HIGH PRIORITY PLACES		12 AZTEC DEITIES TO KNOW	
Avenue of the Dead	Major axis of Teotihuacán's grid layout	Coatlicue	Goddess of the Serpent Skirt; associated with motherhood and death; mother of the god Huitzilopochtli
Aztlan	City where Aztecs originated in the 12 th century	Huitzilopochtli	God of the sun and war; Coatlicue's son; according to legend, he led the Aztecs to their future capital of Tenochtitlán
Cerro Gordo	The Pyramid of the Moon imitates its shape	Quetzalcoatl	Feathered Serpent god; gave knowledge, art, and literature to humans
Guadalajara	Law thesis by Joseph Turibius Gonzalez et Ramirez submitted to this city	Rain God, Fire God, Water Goddess, Goddess of the Moon, God of the Sun, Feathered Serpent	Group of six core deities in the Classic Period culture
Huejotzingo	Residents of this city sued Nuño de Guzmán	Tezcatlipoca	God of the Smoking Mirror; creator deity
Mesoamerica	Paul Kirchhoff coined this term; means "middle America"	Tlaloc	God of rain
Tenochtitlán	Ancient Aztec capital city; sits on Lake Texcoco	Xipe Totec	Lord of the Flayed Skin; associated with agricultural fertility
Teotihuacán	"City of the gods"; features the <i>talud-tablero</i> façade		
Tepayac Hill	Site where Juan Diego saw the Virgin of Guadalupe		
Tikal	Ancient city in Petén, Guatemala; contains six temple pyramids		
Tuxtla Mountains	The Olmecs transported basalt from these mountains for their monumental heads		
Villa de Guadalupe	José María Velasco moved here to paint in the Central Valley		

CRUNCH KIT

List of Lists

12 MEDIUM PRIORITY PEOPLE		15 MEDIUM PRIORITY INSTRUMENTS	
Francisco López Capillas	Renaissance Mexican <i>maestro de capilla</i> ; composed many masses	<i>Antara</i>	Incan panpipe
Sor Juana Inés de la Cruz	Mexican female poet; works were used as text in <i>villancicos</i>	Claves	Wooden sticks used in rumba
Pedro de Gante	Founder of the first music school in Mexico	Dulcian	Early bassoon
João Gilberto	Co-creator of bossa nova	<i>Marimba de arco</i>	Used in <i>son nica</i>
Alberto Ginastera	Argentine avant-garde composer; wrote “Scherzo” from <i>Sonata Op. 47</i>	<i>Marimba de tecomates</i>	Early Guatemalan marimba
Pope Gregory I	Instigator of plainchant	<i>Marimba doble</i>	<i>Marimba sencilla</i> with a second row of chromatic keys
Antonio Carlos “Tom” Jobim	Co-creator of bossa nova	<i>Marimba grande</i>	Range of six and a half octaves
Enrique Jorin	Creator of cha-cha-chá	<i>Marimba sencilla</i>	Can be played by two musicians
Leonor Marzano	Creator of <i>cuarteto</i>	<i>Marimba tenor</i>	Can play five octaves
Tomás de Torrejón y Velasco	<i>Maestro de capilla</i> in Peru; composed <i>La púrpura de la rosa</i>	<i>Marímbula</i>	Bass lamellophone used in <i>son cubano</i>
Heitor Villa-Lobos	Brazilian nationalist composer; composed nine <i>Bachianas brasileiras</i>	<i>Pincollo</i>	Incan flute
Camilo Zapata	Creator of <i>son nica</i>	<i>Pito</i>	Transverse clarinet used in <i>cumbia</i>
		<i>Qquepa</i>	Incan trumpet
		<i>Quenaquena</i>	Incan flute
		<i>Wankara</i>	Double-headed drum used in Andean panpipe ensembles
15 MEDIUM PRIORITY GENRES		10 MUSICAL MOVEMENTS AND ERAS TO KNOW	
<i>A cappella</i>	Polyphonic choral genre popular during the Spanish Renaissance	Renaissance	Imitative polyphony; rise of <i>a cappella</i>
<i>Bomba</i>	Afro-Puerto Rican dance	Baroque	Ornamentation, multiple choirs, contrast, basso continuo, text declamation, extended instrumentation
<i>Capoeira</i>	Brazilian fight-dance	Classicism	Balance, clarity, moderation
Cha-cha-chá	Cuban modern dance and music	Romanticism	Dissonance, atonality, longer pieces
<i>Choro</i>	Brazilian traditional instrumental music	Impressionism	Blurred distinctions between harmony, rhythm, and form
<i>Corrido</i>	Mexican popular song	Primitivism	Elevated rhythm over melody
<i>Danza puertorriqueña</i>	Puerto Rican national dance	Expressionism	Expressed dark inner emotions
<i>Habanera</i>	Cuban dance	Neoclassicism	Emulated earlier Classical styles
<i>Huayno</i>	Andean popular song and dance	Aleatoric music	Allowed chance aspects in performance and composition; also called chance music
Magnificat	Mass written for three choirs	Minimalism	Emphasized simpler elements
Opera	Italian dramatic form; especially popular in South America		
Panpipe music	Andean traditional panpipe ensemble		
Plainchant	Monophonic vocal genre popular in the Church before the Spanish Renaissance		
<i>Plena</i>	Puerto Rican folkloric narrative song		
<i>Seis</i>	Puerto Rican popular dance music		