Anchoring our Units in Concepts that Facilitate Transfer

Here are three ways we ***used to*** organize our units followed by the ***shifts we've made*** that have strengthened our students' abilities to transfer their learning to new situations:

1) **Overly specific units that are difficult to think of several instances of the organizing frame:** Sometimes, units might be focused on a project or a performance, which is great in that there is probably an authentic task and a real audience; we just need to make sure learning is organized around transferable concepts and that students transfer their understanding over the course of the unit so that they are able to apply their learning beyond the project or performance. Proper nouns are easy to distinguish from concepts, such as names of particular books, plays, wars, time periods, styles of art, or music. These are ***not*** concepts and therefore, the unit likely needs reconfiguring to become conceptually-focused so that students have the opportunity to transfer their learning to multiple situations.

2) **Hyper-focused on procedural skills where students rarely stop to consider the purpose or implications of the procedures:** This can be common for more procedural-focused disciplines such as language arts or language acquisition, physical education, the arts, robotics, and frequently, how we teach mathematics, and parts of chemistry and physics. We need to reflect on the purpose and complexity behind these skills, gain clarity on what we want students to understand about the role and function of the skills, their connections to the overall performance, and to each other. And we want students to transfer that understanding to unlock new situations.

3) **Teaching units mostly as predetermined information that we simply want students to know:** This can be common in elementary classes as well as secondary science. For instance, flat and solid shapes, the parts of a plant or cell, evolution, the periodic table, or atomic structure. Much of what we teach in elementary school and in science and mathematics can technically be called concepts, or transferable ideas that serve as an umbrella term for multiple examples. In those cases, it's more about *how* we teach them than simply about what we are teaching. We have to ask ourselves how we can help students see these terms as transferable, organizing ideas that point to the deeper structures of how the world is organized, and can play out in different ways in different situations.

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Cross-Disciplinary Concepts

English Language Arts

Literacy, language, and literature, allow us to be participants in the creation and evaluation of texts that reflect and inform the society in which we live. In large part it's a process-oriented discipline that focuses on *doing* something, usually speaking, listening, reading, and composing with both print and multimodal texts. We want to ensure students understand the larger purpose of the discipline and the role of specific literary elements and tools. We also believe these process oriented concepts shouldn't overshadow the reasons *why* we compose—to better understand ourselves and our world. For that reason we also place particular emphasis on what we call "human experience concepts" like power, identity, truth, beauty, love and loss. Exploring these concepts help build student schema and empower them to construct frameworks for understanding the human experience. The chart below demonstrates examples of topics common in K-12 curriculum along with potential corresponding organizing concepts.

Sample Topics	Potential Organizing Concepts
Stories, Fairy tales	life lessons, friendship, imagination, kindness, struggles
Learning to read	background knowledge, vocabulary, language structures, literacy knowledge, decoding, sight recognition, phonics
Action songs, nursery rhymes	Rhyme, rhythm, meter, structure, message, purpose, audience
I Believe I Can	Belief, potential, diversity, love, identity, shape, space, symbols, mood, structure, color
The BFG	Communication, justice, friendship, identity, plot, setting, characters, conflict, theme
Charlotte's Web	Friendship, home, time, morality, perseverance, plot, setting, characters, conflict, theme
Wonder	Family, identity, courage, kindness, isolation, coming of age, plot, setting, characters, conflict, theme
Non-Fiction Texts	Informative, literary, text features, structure, form, author, audience, context, purpose
Analytical Writing	Claim, evidence, elaboration, author, audience, purpose, context, structure
Peer Editing	Feedback, discourse, communication, collaboration, community, improvement
The Outsiders	Class, honor, violence, deception, friendship, allusion, archetype,

	symbolism, characterization
Poetry	Rhyme, rhythm, meter, structure, figurative language, form, word choice
Multimodal Composition	Mode, structure, design, medium, alphabetic, visual, aural, spatial, gestural, haptic
Lord of the Flies	Fear, power, control, empathy, environment, reason, civilization, symbolism, archetype, allusion, characterization
Dystopian Fiction	systems, power, identity, control, humanity, authoritarianism, truth
Narrative Writing	Plot, setting, characters, conflict, tone, mood, structure, author, audience, context, purpose
Romeo and Juliet	love, hate, loyalty, identity, rivalry, tragedy, figurative language, dramatic elements
The Hate U Give	Systems, structures, oppression, identity, bias, agency, injustice, coming-of-age, symbolism, characterization
The Bluest Eye	Identity, whiteness, blackness, beauty, racism, narratives, symbolism, characterization

English Language Arts Sample Anchoring Concepts

*This is just a sample list, not nearly exhaustive!

Design Concepts		Human-Experience Concepts	
Purpose	Characterization	Friendship	Power
Author	Background knowledge	Insecurities	Control
Audience	Inference	Belonging	Chaos
Mode	Tone	Systems	Social status
Structure	Mood	Oppression	Identity
Discourse	Word choice	Hero	Bias
Interpretation	Word play	Villain	Agency
Time, Context, Period	Tragedy	Fear	Injustice
Design	Humor	Empathy	Coming-of-age
Symbolism	Analysis	Systems	Humanity
Elaboration	Discourse	Family dynamics	Authenticity
Clarity	Communication	Redemption	Healing
Text features	Claim	Justice	Personal growth

Mathematics

Mathematics is a conceptual language, most words are technically organizing ideas. A lot depends on the age of the child and their prior knowledge. For example, “triangle” is a concept for very young children, but

should soon become an *example* of the concept of "shape." Many of the topics listed below are also concepts, so don't spend too much time worrying about whether or not it is a topic or a concept. What's most important is to help students see how sub-concepts help us to understand larger concepts within mathematics and how they are all connected. We also want to ensure we are building conceptual understanding of how mathematics works before we push students to memorization. For example, a kindergarten teacher can ask students how many different ways they can break down or decompose a quantity of five objects. Students experiment with these concepts, visually manipulating objects before they are required to memorize addition and subtraction facts. This principle applies all the way through to advanced mathematics: ***understanding first, usually with visuals, manipulatives, and reflecting on concepts and their connections; then memorization and procedural fluency***

Sample Topics	Potential Organizing Concepts
ABABABAB	Pattern, repeating, extension, relationship, prediction
Telling time	Problem-solving, measurement, organization, structure, elapsed time
Skip Counting	Strategy, number sense, order, quantity, pattern
Find the length	Measurement, scale, precision
Multiply with arrays	Numbers, operations, multiplication, pattern, model
Making surveys	Sampling, representative, measures of center, measures of spread
Volume of Prisms	Shape, dimension, depth, space, translation
Cross-sections	Shape, translation, perspective
Commutative Property	Equivalence, relation, manipulation
Exponent rules	Patterns, number sense, inverse
Quadratic equation	Equivalence, relationship, representation, function
SOH-CAH-TOA	Function, ratio, relationship, correspondence, periodic
Chain Rule	Derivative, function, rate of change, interdependence

Mathematics Sample Anchoring Concepts

*This is just a sample list, not nearly exhaustive!

Pattern	Prediction	Translation
Precision	Equivalence	Dimension
Generalization	Manipulation	Depth
Representation	Models	Space
Properties	Inverse	Function
Sensemaking	Shape	Ratio
Critique	Measurement	Derivative
Estimation	Scale	Integer
Number sense	Probability	Rate of change
Variable	Proportion	Factor
Number systems	Operations	Group Theory

Science

Science is naturally built around concepts such as properties, energy, change, and equilibrium, but so often we teach the details and skills and hope students are implicitly organizing the ideas. By shifting to a conceptual focus, students still use the factual and procedural knowledge, but now as examples of the organizing concepts that allow students to make sense of their world. Providing learning experiences that center around concepts promotes thinking because it points student attention to the deeper structure of science as they construct meaning for themselves. Here are some typical topics in science curriculum and examples of potential anchoring concepts that tap into student curiosity and better prepare them to transfer their learning to complex problems. Many of the topics below are also technically concepts, the trick is to teach them as organizing ideas and ensure there is transfer to multiple situations across a unit.

Sample Topics	Potential Organizing Concepts
Living things	Needs, characteristics, conditions, suitability, energy sources, survival
The Seasons	Change, orbit, axis, poles, hemisphere, pattern, predictions, observations, weather, models *(yes, young children can understand these!)*
Waves	Communication, radiation, manipulation, medium, interference, energy/radiation
Senses	Perception, limitations, response, survival, nervous system, pathway, stimulus
Machines	Enhancement, simple, complex, work, resources, solutions, intelligence, efficiency, creativity, innovation, force, artificial, movement
Plate tectonics	Processes, interconnection, consequences, conditions, patterns and prediction, structure, systems
Metals and Alloys	Properties, use, reactivity, conductivity, extraction
Matter	Use, behavior, properties, change, identity, organization, classification, standardization (common language), states, energy
Parts of a cell	Function, structure, characteristics, job/purpose, form
Atomic structure	Balance, identity, stability, charge, size, model
The Periodic Table	Organization, properties, repetition, tool/resource, language/communication, standardization
Genetics	Patterns, code, relationship, reproduction, sequence, identity, mutation, inheritance, characteristics, trait,
Evolution	Development, change, time, suitability (adapt), species
Ionic and covalent bonding	Interaction, properties, intermolecular, intramolecular, configuration, balance, standardization (naming)
Electricity and magnetism	Connection, flow, attraction, repulsion, energy
Organic chemistry	Form and function, fuels, non renewable, homologous, organization, reactivity, chemical behavior, functional group, characteristics, trends

Science Sample Anchoring Concepts

*This is just a sample list, not nearly exhaustive!

Energy	Form	Reactivity
Force	Function	Chemical behavior
Motion	Structure	Connection
Gravity	Purpose	Flow
Living things	Pattern	Transfer
Characteristics	Interaction	Consequences
Interdependence	Properties	Causes
Behavior	Balance or Equilibrium	Human-environment interaction
Survival	Reproduction	Model
Scale	Change	Quantity
Proportion	Adaptation	Matter

Social Studies

Social studies, as the most human-centered discipline, is often organized around topics and facts, which are examples of important organizing ideas at the heart of the discipline. There is a frequent misunderstanding that we have to choose between teaching conceptually and teaching chronologically. We believe we can teach in chronological order while pointing student attention to transferable, organizing concepts such as conflict, leadership, sovereignty, and authority. Concepts, along with timelines and maps, serve as important tools to help students organize understanding and make sense of complex events, places, and debates about how humans live and have lived on earth.

Sample Topics	Potential Organizing Concepts
Rivers and lakes of Georgia (or anywhere!)	Location, place, natural resources, human-environmental interaction, settlement,
Inuit, Metis, Blackfoot, Cherokee	indigenous communities, human-environmental interaction, sovereignty, perspective, culture, diversity
Capitals (states, provinces, countries, etc.)	Location, place, power, authority, federalism, territories
Ancient Greece	Civilization, resources, systems, governance, social structures
Mesopotamia	Civilization, systems, place, legacy, innovation
The Bill of Rights	Rights, limited government, freedom, justice
Geography of Asia	Natural resources, diversity, scale, spatial patterns
The Renaissance	Culture, innovation, world view, idea exchange
World War II	Conflict, power, competition, cooperation, alliance, nationalism
The Silk Road	Trading, resources, scarcity, choice, consumption
The Cold War	Ideology, democracy, totalitarianism, capitalism, communism, conflict, proxy wars, dictatorship, interference, sovereignty, common enemy, alliance, ally, territory, nationalism, nuclear weapons, domestic affairs
Countries of Africa	Historical significance, culture, complexity, diversity, resources, economics, conflict, change, tradition, influence, colonization, nature, sovereignty, borders, nations, ethnocentric
Macroeconomics	Supply, demand, scarcity, deficit, debt, budget, inflation, growth, policy, stimulus

Social Studies Sample Anchoring Concepts

*This is just a sample list, not exhaustive!

Source/sourcing	Anarchy	Location
Reliability	Tyranny	Place
Point of view and empathy	Limited government	Human-environment interaction
Time, context, and period	Democracy	Movement
Change and continuity	Rights	Region
Causation	Freedom, liberty	Sovereignty
Comparison	Justice	Natural resources
Evidence, argument, and theory	Order	Spatial patterns
Corroboration	Security	Population distribution
Power	Religion	Settlement
Authority	Rule of law	Roles and responsibilities

The Arts

Art, music, theater, drama, dance, and film are all process-oriented disciplines in that we want students to *do* something as the primary focus. We want to ensure students understand the larger purpose of the discipline and the role of specific artistic elements and tools. We also want students to examine and connect human-experience concepts, often called "themes" embedded in art such as love, belonging, insecurities, revenge, and forgiveness. The chart below demonstrates examples of topics common in K-12 curriculum along with potential corresponding, organizing concepts.

Sample Topics	Potential Organizing Concepts
Kabuki Theater	Costumes, dynamism, cultural significance, symbolism, pose, disruption
The Lion King	Emotion, drama, humor, roles, harmony, suspense, coming of age, bravery, redemption, forgiveness
Props and lighting	Mood, design, impact, communication, tone, intensity, realistic, shadows
Impressionists	Movement, composition, light, abstract, technique, color
Print-making	Line, shape, form, texture, space, color, value, medium, message
Neon	Aesthetic, style, mood, nostalgia, material, shape, purpose
Painting	Line, shape, form, texture, space, color, value, movement, depth, illusion
Solo Performance	Simplicity, sound, props, tone, emotion, non-verbal communication
Chopin & Schumann	Composition, improvisation, texture, density, chromatic harmony
Baroque Music	Tonality, key, harmony, improvisation, movement, tempo
Salsa, Tango	Culture, movement, emotion, cultural infusion and diffusion, technique
Dancing	Body, space, time, energy, relationship, expression, storytelling
Commedia dell'arte	Representation, stereotype, comedy, improvisation, history

The Arts Sample Concepts

*This is just a sample list, not exhaustive!

Audience	Rhythm	Body
Design	Dynamics	Time
Purpose	Melody	Energy
Message	Composition	Storytelling
Line	Communication	Balance
Color	Representation	Simplification
Shape	Culture	Weight
Form	Appropriation	Direction
Value	Imagination	Pioneer
Space	Creativity	Tradition
Texture	Emotion	Abstract
Mood	Tone	Visionary
Style	Harmony	Humor
Vanguard	History	Improvisation

PE and Health

Physical education is a process-oriented subject in that we want students to *do* something. Health is a more content-centered discipline in that we want students to know *about* health. However, in both areas, we ultimately want students to make life-long, healthy choices. P.E. has traditionally centered around sports, while health is traditionally centered around healthy decision-making such as reproductive health, nutrition, and staying away from drugs. We can organize learning around transferable concepts that will increase the likelihood of transfer to healthy choices. Students can have the most amazing skills and knowledge in the world but none of it matters if they can't transfer it to unique situations in childhood and beyond.

Sample Topics	Potential Organizing Concepts
Basketball	Invasion, spacing, communication, tactics, sportsmanship, form
Weight-lifting	Progressive overload, hypertrophy, consistency, effort, push-pull
Orienteering	Navigation, degree, terrain, speed
Parts of the body	Systems, vitality, survival, interdependence, physiology
Pilates	Balance, control, alignment, form, endurance
Tennis	Anticipation, position, eye work, sportsmanship
Drugs and Alcohol	Physiology, inebriation, ratio, limits, peer pressure, self-determination
BMI	Nutrition, calorie expenditure, ratio

PE and Health Sample Anchoring Concepts

*This is just a sample list, not exhaustive!

Efficacy	Balance	Nutrition
Equilibrium	Control	Digestion
Systems	Alignment	Mind-Body connection
Survival	Teamwork	Prevention
Interdependence	Feedback	Treatment
Decision-making	Physical activity	Vitality
Space	Muscle	Consistency
Physical health	Fat	Resilience
Mental health	Metabolism	Training
Cardiovascular health	Collaboration	Continuous practice
Strategy	Sportsmanship	Endurance
Offense	Spacial awareness	Healing
Defense	Recovery	Rest
Tension	Well-being	Stress
Stamina	Responsibility	Willpower
Discipline	Performance	Identity-based habits

World Language or Language Acquisition

Language acquisition is a process-heavy discipline in that we want students to be able to *do* something, that is, communicate in the target language. We support three major shifts in the field. One is toward **pattern recognition** rather than overly explicit grammar instruction, the second is **learning content** while learning the language, and the third is **authentic conversations**. We want students to notice patterns and to be able to talk about things that interest them. Therefore, the age of the students might mean a shift from vocabulary about festivals and food to vocabulary about identity and pop culture. We also promote concepts that increase the level of intellectual rigor such as colonization, globalization, and imperialism for secondary students. We want students to explore how language interacts with culture, and how learning another language can teach you a lot about yourself, your own culture, and your own language. Finally, the internet has allowed students to have virtual pen pals, maybe some who want to learn English and are native speakers of the target language. Flipgrid and other platforms even allow dialogue asynchronously.

Sample Topics	Potential Organizing Concepts
Alphabet, phonics, sight words	Symbols, patterns, roots, cognates, false cognates
Vocabulary of the classroom & home	Communication, authentic conversations, identity (who am I), preferences, belonging, community
Famous food, festivals, holidays	Culture, celebrations, values, globalization, colonization, preservation
Verb conjugations, subjunctive tense, transition words	Patterns, sense of time, sense of possibility, efficiency, communication
Parts of speech	Precision of communication, clarity, understanding, miscommunication
Traditions	History, expressions, nonverbal communication, sociolinguistic conventions, heritage, trade, economics, community
Countries (of target language)	History, colonization, cultural heritage, politics, nations, globalization, power, religion
Expressing how I feel	Emotion, belonging, identity, friendship, tone, nonverbal communication
Hobbies	Youth, pop culture, pastimes, values, worldview, globalization, change, tradition, culture, internet, connection, family dynamics

World Languages Sample Anchoring Concepts

*This is just a sample list, not exhaustive!

Patterns	Grammar	History
Authentic conversations	Conjugation	Politics
Parts of speech	Language conventions	Conflict
Symbols	Non-verbal communication	Globalization
Vocabulary	Communication	Migration
Sense of time	Miscommunication	Imperialism
Sense of possibility	Conversations	Colonization
Precision of communication	Identity	Religion
Clarity	Culture	Power
Understanding	Values	Preservation
	Worldview	

*These three "buckets" are another way to think about identifying and choosing language acquisition concepts for a unit.

Grammar/Structure	Culture	Content/Theme
grammar	culture	health
sense of time	religion	homes
sense of possibility	identities	tourism
symbols	customs	pop culture
tense	body language	climate change
parts of speech	celebrations	current events
expressions	values	globalization
patterns	sociolinguistics	migration
clarity	non-verbal communication	politics
precision of communication	worldview	history
language conventions	values	conflict
conjugation	traditions	power
communication	conversation	imperialism
understanding	preservation	colonization

Robotics, Design, Information Technology

These subject areas are gaining increasing importance as we improve machine learning, artificial intelligence, and more. Like mathematics, these disciplines seem to share focus in both process-oriented and content-oriented domains, in that we want students to *do* something but it also requires a fair amount of technical content knowledge. Another key consideration is that technical knowledge and skills shift at a rate faster than most of the other subject-areas. Therefore, it is critical that students understand the fundamental concepts and how they interact in order to transfer their learning to unknown situations. Below are several common topics with corresponding potential organizing concepts.

Sample Topics	Potential Organizing Concepts
Raspberry Pi	Language, data transfer, compatibility, connectivity, control
Minecraft	Modeling, collaboration, ethics, community
Robotics	Intelligence, assistance, dependency, machine learning, programming
Design Thinking	Empathy, creativity, design, prototype, test, evaluate
Typography	Presentation, impact
Pixel graphics	Representation, communication
Ergonomics	Average, equity, access, demographic, suitability, safety
Biomimicry	Resource management, sustainable production
Design innovation	Human needs, human-environment interaction

Robotics, Design, IT Sample Anchoring Concepts

*This is just a sample list, not exhaustive!

Language	Creativity	Human needs
Communication	Intelligence	Human-environment interaction
Modeling	Assistance	Resource management
Collaboration	Dependency	Sustainable production
Ethics	Machine learning	Representation
Community	Presentation	Presentation
Collaboration	Equity	Impact
Survival	Demographic	Empathy
Conditions	Alignment	Repetition
Contrast	Hierarchy	Pattern
Balance	Goal	Space

Many schools seek to create more interdisciplinary or transdisciplinary learning. Here is a list of concepts that work well as a starting point to think about from the point of view of different disciplines and for students to examine what they mean across situations.

System	Communication	Symbolism
Cycle	Perspective	Equality
Process	Collaboration	Audience
Interdependence	Goal-Setting	Message
Pattern	Contrast	Persuasion
Change	Balance/Equilibrium	Evidence
Causation (Cause & Effect)	Collaboration	Culture
Form	Ethics	Identity
Characteristic	Community	Bias
Function	Energy	Worldview
Purpose	Power	Truth
Modeling	Representation	Deception
Proportion	Manipulation	Value