APPENDIX B. Sample Projects

PROJECT 1: Whose Bug Is It Anyway?

Level: Kindergarten

Subject: Science

The following project covers several interdependent Next Generation Science Standards (California) related to Ecosystems: Animals, Plants, and Their Environment in Kindergarten. In this project, kindergarteners are being asked their opinion on whether local gardeners should introduce invasive species as a means of protecting gardens from pests. Students spend a significant amount of time understanding the similarities and differences among animals, plants, and their environment as they relate to energy consumption. Students also explore human interactions with the environment and how such interactions dramatically influence local and global environments. Students have targeted surface-, deep-, and transfer-level tasks and workshops that enable them to build a solid foundation of scientific understanding. The conclusion of the project has students explore overfishing and how such human actions disrupt energy consumption. The new context focuses on the relationships of animals, plants, environments, and humans; but it also provides a new perspective on intentionally removing species from an environment rather than introducing a new species to an environment.

Key Standards

Students who demonstrate understanding can

K-LS1-1. Use observations to describe patterns of what plants and animals (including humans) need to survive. [Clarification Statement: Examples of patterns could include that animals need to take in food but plants do not, the different kinds of food needed by different types of animals, the requirement of plants to have light, and, that all living things need water.]

K-ESS2-2. Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs. [Clarification Statement: Examples of plants and animals changing their environment could include a squirrel digs in the ground to hide its food and tree roots can break concrete.]

K-ESS3-1. Use a model to represent the relationship between the needs of different plants or animals (including humans) and the places they live. [Clarification Statement: Examples of relationships could include that deer eat buds and leaves, therefore, they usually live in forested areas, and grasses need sunlight so they often grow in meadows. Plants, animals, and their surroundings make up a system.]

K-ESS3-3. Communicate solutions that will reduce the impact of humans on the land, water, air, and/or other living things in the local environment. [Clarification Statement: Examples of human impact on the land could include cutting trees to produce paper and using resources to produce bottles. Examples of solutions could include reusing paper and recycling cans and bottles.]

(*Continued*)

PHASE 1	PHASE 2	PHASE 3	PHASE 4
• Launch project. • Conduct pre/post assessment. • Go through Know/Need to Know list.	• Engage in surface workshops. • Begin completing major tasks at surface level.	• Engage in deep learning workshops. • Postassessment • Begin completing major tasks at deep level.	• Presentation • Reflection • Provide new context for students to discuss.

PROJECT DESIGN

STEP 1: Learning Intention(s)

- **Learning Intention (1):** I can tell others why plants and animals change their environment to survive.
- **Learning Intention (2):** I can show others why plants and animals live in different environments.
- **Learning Intention (3):** I can tell others how humans can improve the local environment, which they sometimes hurt.

STEP 2: Success Criteria

Surface	Deep	Transfer
• Define *plant*, *animal*, and *environment.* • List examples of human impact.	• Relate animals and plants to their needs (e.g., energy needs). • Relate animals and plants to different environments. • Relate human impacts to animals and plants.	• Design a solution to a human-caused issue that will improve the local and global environment.

STEP 3: Driving Question(s)

How do humans improve their local and global environment to prevent the loss of animals and plants? [in your neighbor's garden]?

Context

- Invasive species (in our gardens)–insects, plants–bamboo
- Overfishing
- Plastic bottles
- Litter
- Reintroduction of a species
- Global warming

STEP 4: Tasks

Surface	Deep	Transfer
• Label key images.	• Design a visual diagram that illustrates the relationships among plants, animals, and humans.	• Select one of these problems, then present a solution to adults using text and visuals.

STEP 5: Entry Event

Scenario . . . Local gardeners want to use insects to control pests.

Expectations. . . . Present a solution that includes reasons for finding native solutions to biocontrol issues.

Patrons. . . . Local gardeners (parents, community members, staff)

Format . . . Public presentation to adults (with accompanying resources–visuals)

(*Continued*)

WORKSHOPS		
Surface	Deep	Transfer
• Classification of animals, plants, and environments (four workshops reviewing animals, plants, and environments) using a jigsaw method • Read fiction and nonfiction selections on gardens.	• Draw relationships between animals and plants using nonlinguistic representation (Students will have multiple images that they must categorize to demonstrate relationships.) • Perspective analysis on human involvement with the local and global environment.	• Compare and contrast problems between overfishing (orange roughy) and our local garden.

PROJECT CALENDAR					
	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1 *[Phase 1 and Phase 2]*	Project launch (Local gardeners discuss biocontrol issue; include key "breadcrumbs.") Start with aphids and ladybugs. Preassessment (oral assessment) Students go through a Know/Need to Know process.	Surface workshops (How do we classify animals, plants, and environments?)	Surface Animals Reading workshop—nonfiction	Surface Plants Reading workshop—fiction	Surface Environment
Week 2 *[Phase 2 and Phase 3]*	Review Know/Need to Know list. Meet with local gardeners to discuss how plants and animals intersect in the garden. Watch a video clip on animals and plants in other environments.	Deeper workshop Relationships. Nonlinguistic representation workshop	Deeper workshops Visit the garden. Take observations and then check on categorization from previous workshop.	Deeper workshop Perspective analysis	Reading workshop—nonfiction
Week 3 *[Phase 3 and Phase 4]*	Postassessment review Know/Need to Know list	Prepare for presentations. Critical Friends Team review	Present bio control solutions to local gardeners.	Transfer workshop How do we address overfishing (orange roughy)? How is this problem similar to our garden problem? How does it differ?	Reflections

PROJECT 2: Ratios, Rates, and Real Estate Oh My. . . .

Level: Sixth Grade

Subject: Mathematics

This project focuses on understanding and applying unit rates (comparing a quantity to one unit of another quantity) to common practices in society. Students are expected to understand rates (ratios of two quantities with different units) and how to calculate rates (e.g., unit pricing and constant speed). This project requires students to use their knowledge and application of rates in the world of real estate and specifically how absorption rates (i.e., dividing the number of sales by number of available homes) impact various communities by influencing short-term and long-term appraisals. The project concludes with a one-day problem on applying the same math content in a different context. For instance, the project asks student to identify the absorption rates of different brands of paper towels and how such information may impact consumer decision making.

Key Standards

CCSS.MATH.CONTENT.6.RP.A.1

Understand the concept of a ratio and use ratio language to describe a ratio relationship between two quantities.

CCSS.MATH.CONTENT.6.RP.A.2

Understand the concept of a unit rate a/b associated with a ratio a:b with $b \neq 0$, and use rate language in the context of a ratio relationship.

CCSS.MATH.CONTENT.6.RP.A.3

Use tables of equivalent ratios, tape diagrams, double number line diagrams, or equations.

MATHEMATICAL PRACTICES

All Mathematical Practices are covered.

PHASE 1	PHASE 2	PHASE 3	PHASE 4
• Launch project. • Conduct pre/postassessment. • Go through Know/Need to Know list.	• Engage in surface workshops. • Begin completing major tasks at surface level.	• Engage in deep-learning workshops. • Postassessment • Begin completing major tasks at deep level.	• Presentation • Reflection • Provide new context for students to discuss.

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PROJECT DESIGN

STEP 1: Learning Intention(s)

- I can use rates and unit rates to solve problems.
- I can express rates and unit rates to solve problems using models, tables, and line drawings.

STEP 2: Success Criteria

Surface	Deep	Transfer
• Define *rate*, *unit rate, unit pricing, ratio, constant speed, average speed.* • Solve unit rate problems using one method. • Describe unit rate problems using a visual representation.	• Relate rate terms. • Solve unit rate problems using different methods (multiplication expression or division expression). • Relate models, tables, and line drawings to unit rate problems.	• Apply models, tables, and line drawings to various contexts in which rates and unit rates are germane.

STEP 3: Driving Question(s)

How do rates enable people to make decisions (such as housing appraisals in your local community)?

Context

- Absorption rates (e.g., paper towels, real estate)
- Heart rate (monitoring)

STEP 4: Tasks

Surface	Deep	Transfer
• Complete a number talk expressing different ways to find ratios. • Present to others how ratios compare two quantities that have the same unit. • Solve rate problems numerically and verbally.	• Compare and contrast different ways (models) to represent rates. • Show processes and solutions to rate problems using different methods to represent data.	• Present multiple representations of rates to an audience to help inform decision making.

STEP 5: Entry Event

Scenario . . . Local community real estate

Expectations . . . Use multiple representations of rates to influence decision making.

Patron . . . Home buyers, sellers, and real estate agents

Format . . . Presentation from real estate agent—Preview online Huffington Post article "What Is Absorption Rate in Real Estate and Why Is It Important?"

WORKSHOPS

Surface	Deep	Transfer
• Direct instruction workshop: What is a rate? How is it calculated? How can one convey a rate?	• Provide direct modeling of a rate problem using multiple methods of representation. Students practice in triads to solve a rate problem and demonstrate the solution using different representations. Present representations to the larger class using academic vocabulary.	• Critical Friends Team feedback on real estate models • Compare and contrast absorption of paper towels with absorption of real estate.

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PROJECT CALENDAR					
	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1 *[Phase 1 and Phase 2]*	Project launch preassessment	Surface workshops What are rates?	Surface Rate calculations Different interpretations	Practice/feedback	Review Know/Need to Know list. Surface workshops Practice Feedback
Week 2 *[Phase 2 and Phase 3]*	Deeper workshop Relationships Modeling practice	Deeper workshop Relationships Modeling practice	Deeper workshop Relationships Modeling practice	Deeper workshop Relationships Modeling practice	Postassessment review Know/Need to Know list
Week 3 *[Phase 3 and Phase 4]*	Review real estate problem.	Transfer workshop—Reviewing models. Critical Friends Team review with others.	Present to local community.	Transfer workshop Transfer understanding of learned concept (i.e., rate) to a new context.	Reflections

PROJECT 3: Changing or Maintaining Our Imperialist Imperative

Level: High School

Subject: Social Studies and English Language Arts

The following project focuses students on understanding the significant impact of industrialized nations on developing nations. Specifically, the project addresses parts of History-Social Sciences Content Standard 10.4:

Key Standards

10.4.1 Describe the rise of industrial economies and their link to imperialism and colonialism (e.g., the role played by national security and strategic advantage; moral issues raised by the search for national hegemony, Social Darwinism, and the missionary impulse; material issues such as land, resources, and technology).

10.4.2 Discuss the locations of the colonial rule of such nations as England, France, Germany, Italy, Japan, the Netherlands, Russia, Spain, Portugal, and the United States.

10.4.3 Explain imperialism from the perspective of the colonizers and the colonized and the varied immediate and long-term responses by the people under colonial rule. (http://www.cde.ca.gov/be/st/ss/documents/histsocscistnd.pdf)

The project focuses on military, social, and economic reasons for industrialized nations to interact and fundamentally influence other nations—and on the positive and negative impacts those relationships have on both parties. The project offers students the opportunity to look at contemporary issues. First, students are faced with understanding the role of the United States in the development of and maintenance of ISIS and how to face growing local and global concerns of such a development. Students develop a thorough understanding of imperialism by looking at historical patterns and analyzing causes, characteristics, and effects of European imperialism and how such patterns reflect contemporary behavior. At the conclusion of the project, students look at emerging countries and their spread of imperialism to other nations (e.g., China on Taiwan) and what role the United States should play in an omnipresent global community.

PHASE 1	PHASE 2	PHASE 3	PHASE 4
• Launch project. • Conduct pre/ postassessment. • Go through Know/Need to Know list.	• Engage in surface workshops. • Begin completing major tasks at surface level.	• Engage in deep-learning workshops. • Postassessment • Begin completing major tasks at deep level.	• Presentation • Reflection • Provide new context for students to discuss.

(Continued)

PROJECT DESIGN

STEP 1: Learning Intention(s)

The Industrialized nations' desire for abundant resources and new markets for their goods coupled with feelings of cultural superiority (such as Social Darwinism) and increased military power allowed for and encouraged imperial expansion. Imperialism had lasting positive and negative effects.

STEP 2: Success Criteria

Surface	Deep	Transfer
• The student lists political, economic, and social reasons that drove 19th century European imperialism.	• The student relates the causes, characteristics, and effects of 19th century European imperialism, making evaluations of specific countries' imperialistic actions.	• The student evaluates the present day legacy of imperialism in at least one region of the world. • The student makes a hypothesis on the impact imperialism has in various contemporary contexts.

STEP 3: Driving Question(s)

How do the United States and other industrialized imperial nations prevent creating new global enemies?

Context

- ISIS
- Global trade
- Economic sanctions

STEP 4: Tasks

Surface	Deep	Transfer
Address the following in pairs and with the class: • Identify conditions of imperialism. • Define terms and concepts of *Social Darwinism*, *patriarchy*, and *capitalism*. • Identify types and sources of power: political, economic, religious, ideological	Using case study material for 19th century US, European, Middle Eastern, African, and Asian nations, build a graphic organizer that • identifies which nations had power and what type. • identifies the basis for the types of powers listed above. • explains how that power was exercised. • determines what impact imperialistic nations had on each nation. • identifies the conditions that existed in each nation that either resulted in it becoming a dominant or dominated nation.	• Develop a white paper on the best solution for the United States and allied forces to employ to ensure the safety and security of the people around the world by defeating groups such as ISIS. • Present three actions the United States and allied nations can take to mitigate risk to citizens while building positive relations with previously imperialized regions of the world.

STEP 5: Entry Event

Scenario . . . Expansion of ISIS is causing the US government to rethink its military strategy.

Expectations . . . Present three actions to a panel on what actions the United States can take to mitigate risk to citizens and establish positive relations in the region.

Patron . . . Social studies department

Format . . . Written memo

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WORKSHOPS			
	Surface	Deep	Transfer
	• Making sense of resources: What conditions led to imperialism?	• Ideological conflicts: Why do different people have different ideas about government, economics, and religion? • What were the causes and effects of imperial conflicts such as the Boer War, Opium War, and Raj rebellions?	• Comparative conflicts • Students will select a current world conflict and analyze the economic, political and ideological conditions that led to these conflicts and determine if they are remnants of the imperialist era practices. • Students will make predictions about current geopolitical situations and determine if the conditions are ripe for conflict and if so, what measures can be taken to avoid conflict and bring about peace and stability.

PROJECT CALENDAR					
	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1 *[Phase 1 and Phase 2]*	Project launch Preassessment	Surface workshop(s) (Define terms)	Surface workshop(s) (Sources and conditions)	Pair discussions/ Jigsaw (Sources and conditions)	Pair discussions/ Jigsaw (Sources and conditions)
Week 2 *[Phase 2 and Phase 3]*	Deep workshops(s) Ideological conflict Case study review Provide graphic organizer draft.	Deep workshop Conflict snapshot Case study review Construct graphic organizer.	Deep workshop Conflict snapshot Case study review Feedback on graphic organizer.	Deep workshop Review US actions. Complete graphic organizer.	Deep workshop Review white paper exemplars.
Week 3 *[Phase 3 and Phase 4]*	Transfer workshops Current issues Current solutions Assessment Brainstorm	Transfer workshops Current issues (looking at different contexts) Develop white paper.	Transfer workshops Critical Friends on white paper Prepare 5-minute presentation.	Present solution. Submit paper. Discuss new topics.	Reflect

PROJECT 4: Fables, Futures, and Forecasts

Level: Third Grade

Subject: English Language Arts

The following project requires students in the third grade to develop their skills in writing by developing an opinion piece that includes a point of view with a clear rationale. To receive full marks on the final product, the students must convey their ideas clearly and must provide thorough and accurate evidence that supports their opinion. To be effective, the implementation of the project must specifically focus on the targeted skill sets while using students' knowledge gained in previous years to ensure that they are concentrating on learning new writing techniques rather than focusing on the unfamiliar context. In the second grade, students spent significant time recounting stories including fables and folktales from diverse cultures and spent time determining their central message, lessons, or morals. This project relies on the students' background knowledge of this genre of literature.

The conclusion of the project has students conduct an author's speak where students present their writing to a group of parents, community members, teachers, and peers. The presentation includes a series of questions and answers in which the students must discuss how they conducted their research and reached a point of view. After the presentations, the teacher tasks students with writing a brief opinion piece on other subjects of interest that are linked to the students' prior knowledge.

Key Standards

Students who demonstrate understanding can

CCSS.ELA-LITERACY.W.3.1

Write opinion pieces on topics or texts, supporting a point of view with reasons.

CCSS.ELA-LITERACY.W.3.1.A

Introduce the topic or text they are writing about, state an opinion, and create an organizational structure that lists reasons.

CCSS.ELA-LITERACY.W.3.1.B

Provide reasons that support the opinion.

CCSS.ELA-LITERACY.W.3.1.C

Use linking words and phrases (e.g., *because, therefore, since, for example*) to connect opinion and reasons.

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CCSS.ELA-LITERACY.W.3.1.D

Provide a concluding statement or section.

CCSS.ELA-LITERACY.W.3.2

Write informative/explanatory texts to examine a topic and convey ideas and information clearly.

CCSS.ELA-LITERACY.W.3.2.A

Introduce a topic and group-related information together; include illustrations when useful to aiding comprehension.

CCSS.ELA-LITERACY.W.3.2.B

Develop the topic with facts, definitions, and details.

CCSS.ELA-LITERACY.W.3.2.C

Use linking words and phrases (e.g., *also, another, and, more, but*) to connect ideas within categories of information.

CCSS.ELA-LITERACY.W.3.2.D

Provide a concluding statement or section.

PHASE 1	PHASE 2	PHASE 3	PHASE 4
• Launch project. • Conduct pre/ postassessment. • Go through Know/Need to Know list.	• Engage in surface workshops. • Begin completing major tasks at surface level.	• Engage in deep-learning workshops. • Postassessment • Begin completing major tasks at deep level.	• Presentation • Reflection • Provide new context for students to discuss.

(*Continued*)

PROJECT DESIGN

STEP 1: Learning Intention(s)

- **Learning Intention (1):** I can write and support my opinion on a topic.
- **Learning Intention (2):** I can write on a topic that conveys information clearly.

STEP 2: Success Criteria

Surface	Deep	Transfer
• Use *because, therefore, since*, *for example.* • Identify reasons, opinions, points of view in texts and own writing.	• Link *because, therefore, since*, and *for example* to opinions and reasons. • Sequence reasons, opinion, and points of view in own writing and in text. • Connect facts, definitions, and details to backup opinion.	• Write an opinion piece that includes a clear rationale with details, definitions, and facts to enable others to understand your ideas.

STEP 3: Driving Question(s)

How do we use the lessons conveyed in the stories of our youth to [develop classroom rules]?

Context

- Classroom rules
- Study habits
- Understanding others
- Developing friendships
- Future goals and actions
- Predict our future based on our decisions

STEP 4: Tasks

Surface	Deep	Transfer
• Identify connecting words in texts. • In dyads, practice sharing and backing up opinions with facts.	• Write a series of paragraphs that sequence reasons, opinions, and points of view. • Develop a narrative organizer that relates details to specific opinions. • Review texts for connecting words, points of view, and related rationale.	• Develop an opinion piece.

STEP 5: Entry Event

Context . . . Third-grade classroom
Expectations. . . . Develop an opinion piece
Patron. . . . School community
Format . . . Written piece and public presentation including a Q&A

WORKSHOPS

Surface	Deep	Transfer
• Workshop exploring connectors (Use *because, therefore, since, for example.*) • Identify reasons, opinions, points of view in texts and own writing.	• Review and evaluate student work in light of success criteria. • Craft organizers to link opinions to data that supports and or refutes ideas.	• Analyze the structure of an opinion piece in different situations.

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PROJECT CALENDAR					
	Monday	Tuesday	Wednesday	Thursday	Friday
Week 1 *[Phase 1 and Phase 2]*	Project launch Review fables. Review exemplar opinion pieces. Discuss success criteria. Review examples of excellence.	Surface workshops Practice writing. Dyad practice Find a fable.	Surface Identify reasons, opinions, points of view in texts and own writing. Practice writing.	Surface Practice writing.	Deep Review and evaluate student work in light of success criteria.
Week 2 *[Phase 2 and Phase 3]*	Practice writing.	Deeper workshops Craft organizers to link opinions to data that supports or refutes ideas.	Practice writing.	Submit draft. Receive feedback (make changes).	Deep to transfer workshops Analyze the structure of an opinion piece.
Week 3 *[Phase 3 and Phase 4]*	Submit draft II. Receive feedback (make changes).	Author's Speak—Based on feedback, make corrections.	Transfer workshop Craft an opinion piece developing effective study habits and review with peers using success criteria.	Reflections Analyze the structure of an opinion piece in different situations.	