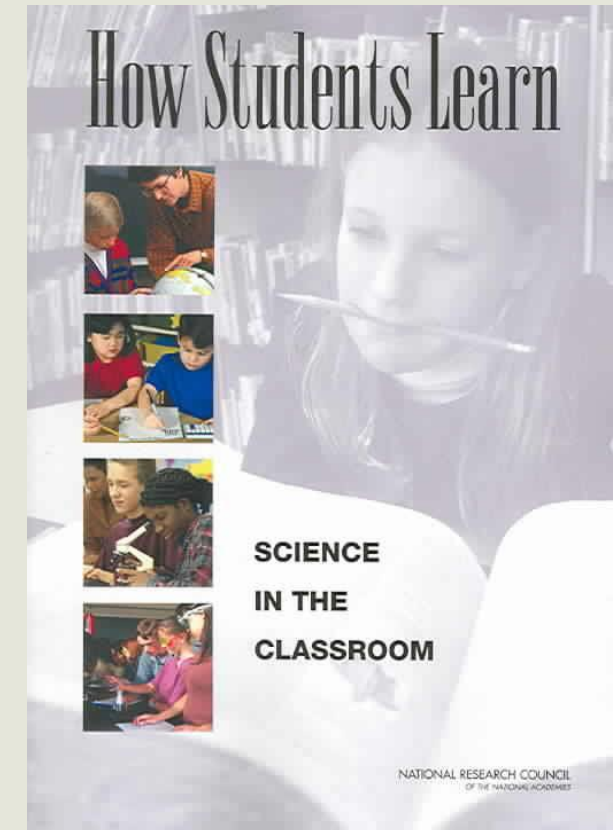
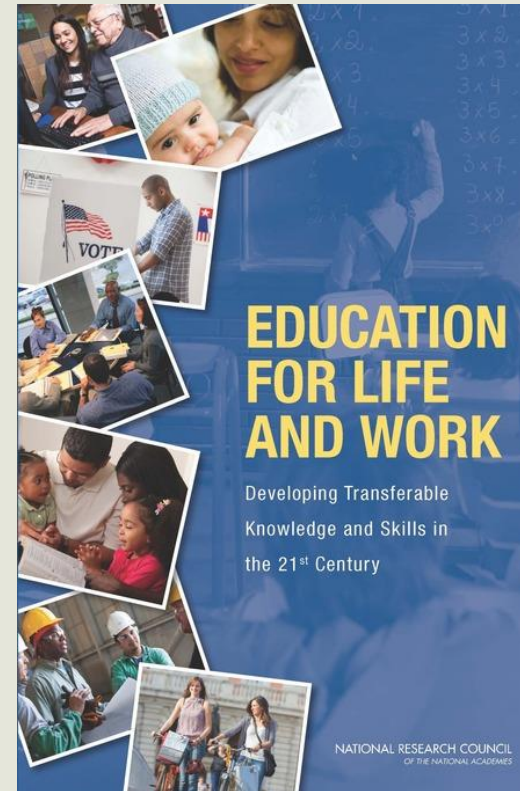
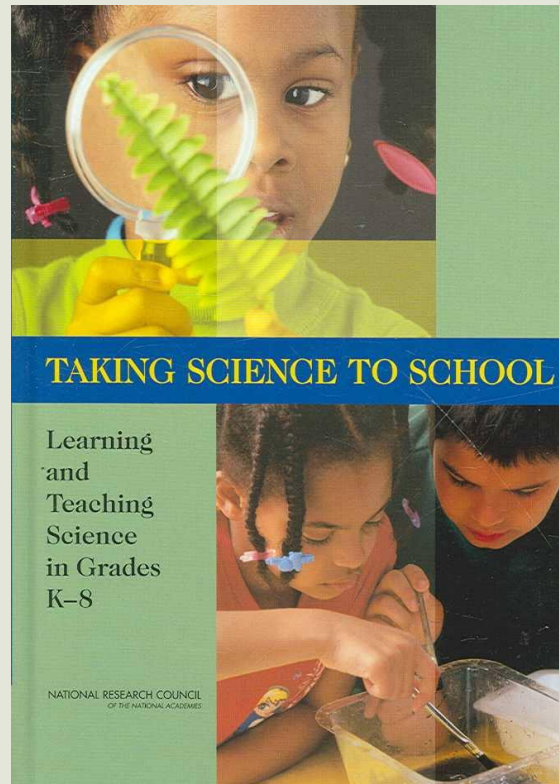
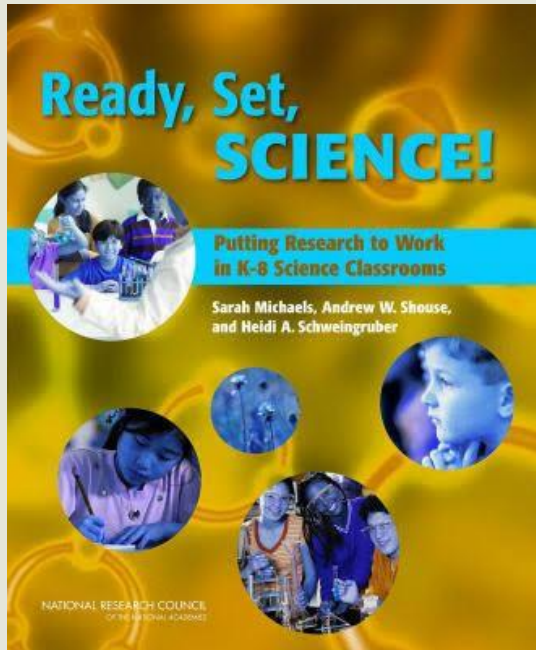
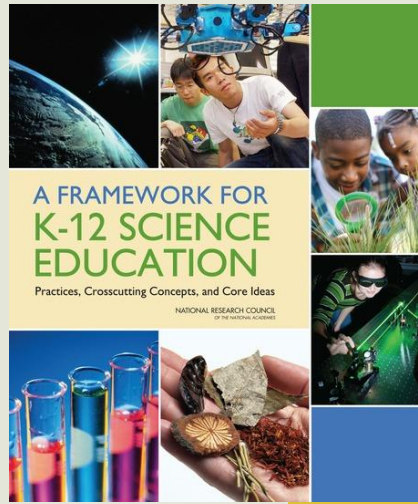
The background is a dark green chalkboard with various white chalk sketches. On the left, there is a large drawing of a microscope. Above it is a globe on a stand. Below the microscope are several books. In the bottom right, there are mathematical symbols including a percentage sign, a division sign, and a less-than sign. The text is centered in the upper half of the board.

Irvine Unified School District Next Generation Science Standards Implementation

NRC Research and NGSS Development





A FRAMEWORK FOR
K-12 SCIENCE
EDUCATION
Practices, Crosscutting Concepts, and Core Ideas
NATIONAL RESEARCH COUNCIL
OF THE NATIONAL ACADEMIES

By the end of 12th grade *all* students:

- have an appreciation of the beauty and wonder of science; possess sufficient knowledge of science and engineering to engage in public discussions on related issues
- are careful consumers of scientific and technological information related to their everyday lives
- are able to continue to learn about science outside school
- have skills to enter careers of their choice, including but not limited to careers in science, technology, and engineering

Conceptual Shifts

- Preparing students for college, careers, and citizenship
- Practicing science and engineering through real world application
- Encouraging teaching in context and integrating core concepts (aligned with ELA and Math standards)
- Building concepts coherently K-12 to generate deeper understanding and application – our focus is not just the “what” but also the “how” and the “why”
- Raising engineering to the same level as inquiry science; integrated K-12
- Teaching the three dimensions of each standard: Science and Engineering Practice, Disciplinary Core Idea, and a Cross Cutting Concept

Old vs New

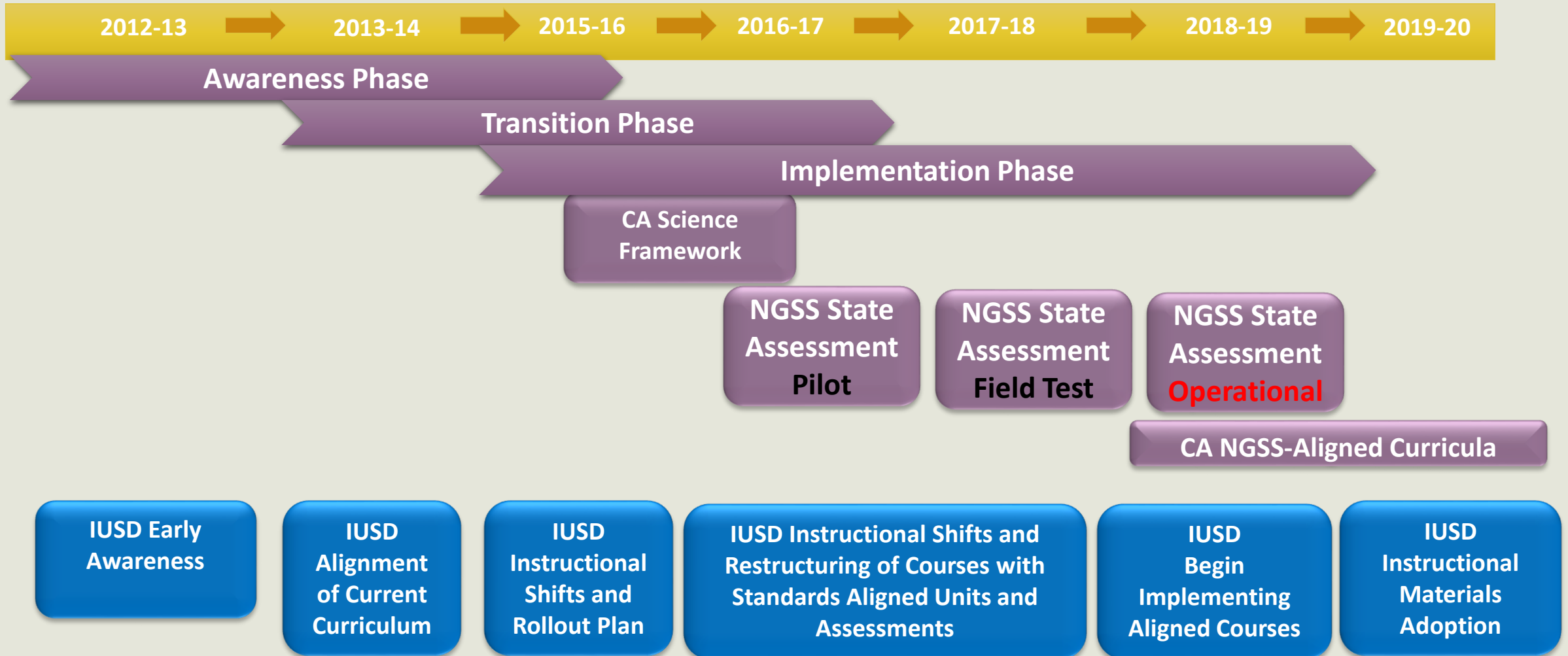
Old (1998) Middle School Science Standards

- **Distinguish** between atom and molecules
- **Describe** the difference between pure substances (elements and compounds) and mixtures
- **Describe** the movement of particles in solid, liquid, gas, and plasma states
- **Recognize** that there are more than 100 elements and some have similar properties as shown on the Periodic Table of Elements

New (NGSS) Middle School Science Standards

- **Construct and use models** to explain that atoms combine to form new substances of carrying complexity
- **Plan investigations** to generate evidence supporting the claim that one pure substance can be distinguished from another based on characteristic properties
- **Construct an argument** that explains the effect of adding or removing thermal energy to a pure substance in different phases and during a phase change in terms of atomic and molecular motion

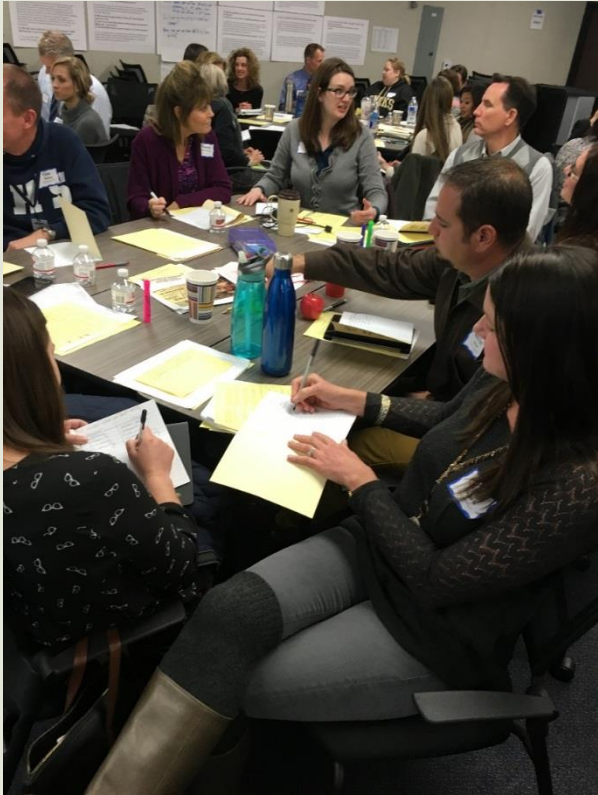
NGSS Timeline



The Journey



Next Generation Science Standards Implementation Committee

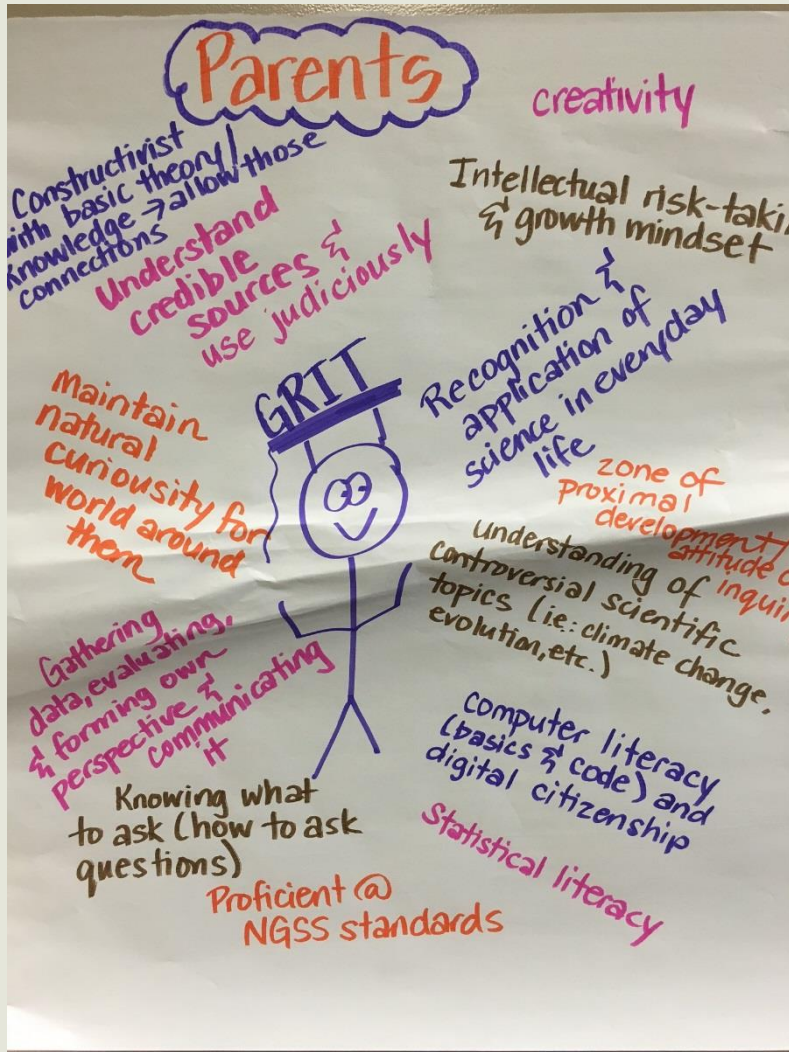


- Current reality of science education in IUSD
- Develop a vision of what a rigorous 21st century Science education looks like
- Identified the needs of all stakeholders

Student Voice



Identified Implementation Needs



- College and Career Readiness for All
- Equity of Access and Experiences
- Engaging Science Courses with Real World Application
- Meet the Instructional Needs of All Students
- Manageable and Strategic Transition
- Teacher and Administrator Efficacy and Preparedness
- Clear Communication

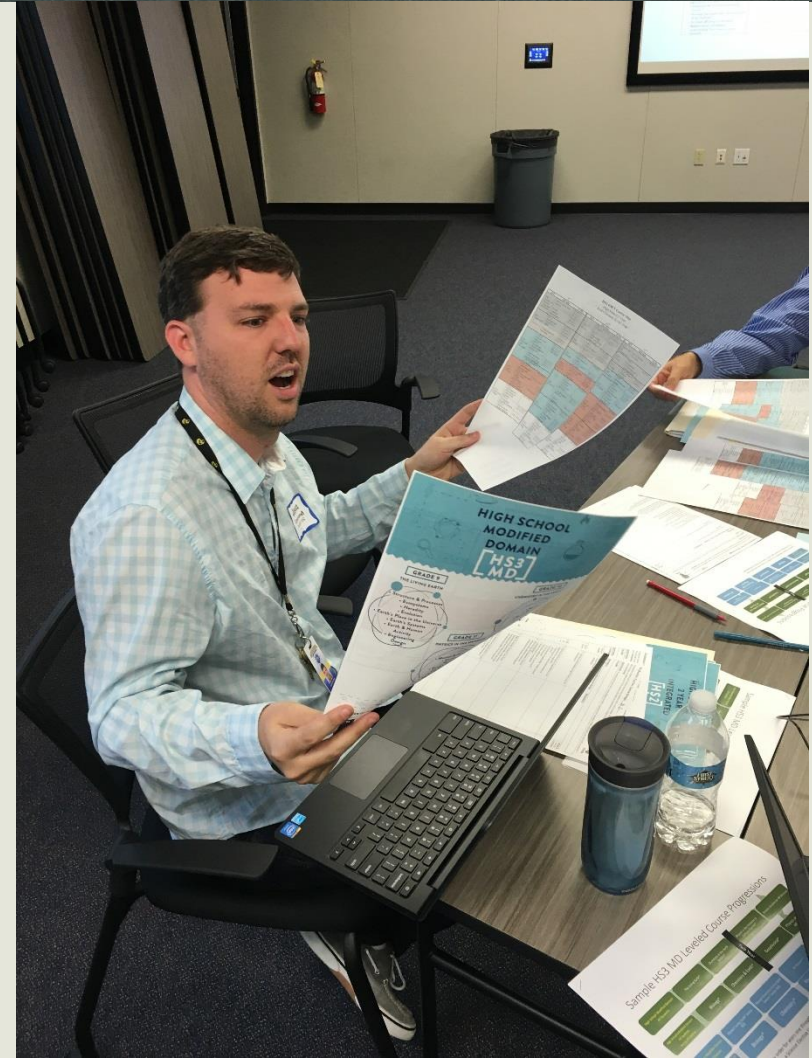
The Work

Transition Timeline

Instructional Agreements

Course Sequences

Professional Development



Course Model Decisions



HIGH SCHOOL EVERY SCIENCE EVERY YEAR [HS ESEY]

HS3 ESEY Course Map
High School 3 Year
Every Science, Every Year

GRADE 9

- Matter
- Motion & Stability
- Forces & Interactions
- Structure and Processes
- Earth's Systems
- Engineering Design

GRADE 10

- Energy
- Waves
- Heredity
- Ecosystems
- Earth's Systems
- Evolution
- Earth's Systems
- Engineering Design

GRADE 11

- Matter
- Energy
- Waves
- Ecosystems
- Evolution
- Earth's Place in the Universe
- Earth's Systems
- Earth & Human Activity
- Engineering Design

HS3 ESEY Course Map (Table)

Sample HS3 ESEY Levelled Course Progressions

Northwood HS

HIGH SCHOOL MODIFIED DOMAIN [HS3 MD]

HS3 MD Course Map
High School 3 Year
Modified Domain

GRADE 9

THE LIVING EARTH

- Structure & Processes
- Ecosystems
- Heredity
- Evolution
- Earth's Place in the Universe
- Earth's Systems
- Earth & Human Activity
- Engineering Design

GRADE 10

CHEMISTRY IN THE EARTH SYSTEM

- Matter
- Energy
- Earth's Systems
- Earth & Human Activity
- Engineering Design

GRADE 11

PHYSICS IN THE UNIVERSE

- Motion & Forces
- Energy
- Waves
- Earth's Place in the Universe
- Earth's Systems
- Engineering Design

HS3 MD Course Map (Table)

Sample HS3 MD Levelled Course Progressions

Jarvis HS
Woodbridge HS
University HS
CRE@science HS, but can change

Resources to Support a Smooth Transition

Designated Science Lead Teachers:

- Develop course scope and sequences, identify resources
- Develop exemplary units and collaborative assessments
- Finalize timeline for implementation, professional development, and instructional recommendations



