

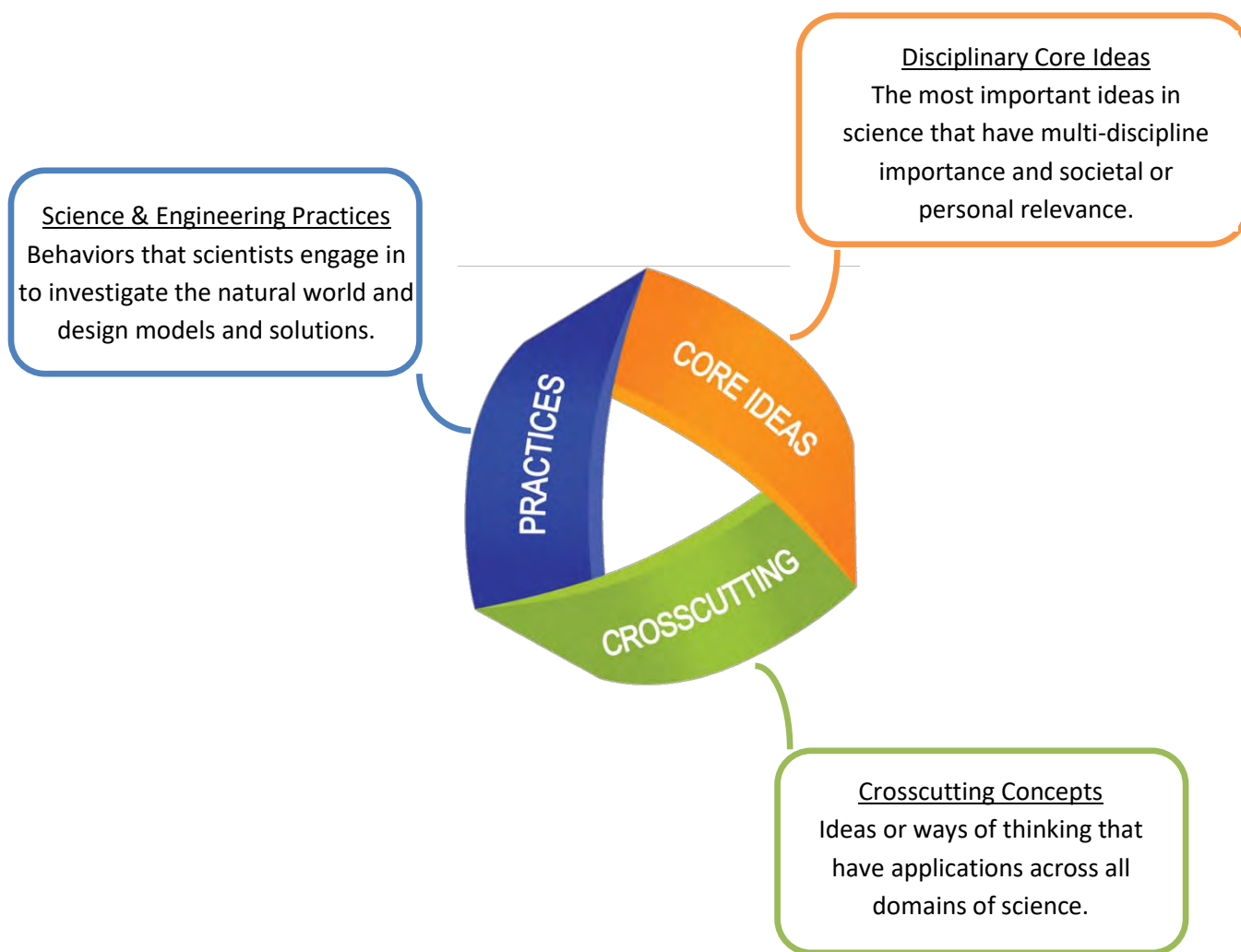


***Next Generation Science Standards and Common Core alignment with
King County Level Three Water Conservation and Pollution Prevention***

Best Practices Guide

High School

Next Generation Science Standards (NGSS) Categories



Level Three –Water Conservation and Pollution Prevention

High School

The connections between the **Next Generation Science Standards** (NGSS) and **King County Level Three Best Practices Guide** uses the matrices created by the National Science Teachers Association (NSTA) available at <http://ngss.nsta.org/ngss-tools.aspx>.

Note: In this reference sheet an italicized number and title refers to a specific action choice in the Best Practices Guide. For example, “*10. Test local water* – “on page 3 is for schools that choose #10 in the Education and Outreach section of the Best Practices Guide as one of their Level Three actions.

Assess and Monitor section of the Level Three Best Practices Guide

- Define a design problem that involves the development of a process or system with interacting components and criteria and constraints that may include social, technical and/or environmental considerations.

- Manipulate variables and collect data about a complex model of a proposed process.

- Humanity faces major global challenges today, such as the need for supplies of clean water and food or for energy sources that minimize pollution.

- When evaluating solutions it is important to take into account constraints and to consider social, cultural and environmental impacts.

- Criteria may need to be broken down and approached systematically, acknowledging tradeoffs.

- Cause and effect relationships can be suggested and predicted for complex natural and human designed systems by examining what is known about smaller scale mechanisms within the system.

Education and Outreach section of the Level Three Best Practices Guide

1., 12., 20-22. Train others – Communicate scientific and/or technical information or ideas in multiple formats.

2. Local watershed project and 3. Start a schoolyard habitat – Define a design problem that involves the development of a system with criteria and constraints that may include social, technical and/or environmental considerations.

10. Test local water – Select appropriate tools to collect, record, analyze, and evaluate data.

8., 11. Learn about local and world water sources – Critically read scientific literature adapted for classroom use to determine the central ideas or conclusions and/or to obtain scientific and/or technical information to summarize complex evidence, concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

2. Local watershed protection project – The abundance of liquid water on Earth's surface and its unique combination of physical and chemical properties are central to the planet's dynamics.

11. Climate change connections – Through computer simulations and other studies, important discoveries are still being made about how the ocean, the atmosphere, and the biosphere interact and are modified in response to human activities.

15., 16., 17. Stormwater protection design –

- Criteria and constraints also include satisfying any requirements set by society, such as taking issues of risk mitigation into account, and they should be quantified to the extent possible and stated in such a way that one can tell if a given design meets them.
- Both physical models and computers can be used in various ways to aid in the engineering design process.
- Criteria may need to be broken down into simpler ones approached systematically.

15., 16., 17. Stormwater protection design –

- Investigating or designing new systems or structures requires a detailed examination of the properties of different materials, the structures of different components, and connections of components to reveal its function and/or solve a problem.
- Systems can be designed for greater or lesser stability.

Indoor Water Conservation section of the Level Three Best Practices Guide

- Design, evaluate, and/or refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

2. Measure faucet flow and 5. Reduce water used in toilet flushing - Plan and conduct an investigation: decide on types, how much, and accuracy of data needed, and refine the design accordingly.

2. Measure faucet flow and 5. Reduce water used in toilet flushing - When evaluating solutions it is important to take into account a range of constraints including cost, safety, reliability and aesthetics and to consider social, cultural and environmental impacts.

The following Crosscutting Concepts can easily be worked into these actions. Contact your King County Green Schools Program representative for assistance.

- The significance of a phenomenon is dependent on the scale, proportion, and quantity at which it occurs.
- Systems can be designed for greater or lesser stability

Outdoor Water Conservation section of the Level Three Best Practices Guide

- Design, evaluate, and/or refine a solution to a complex real-world problem, based on scientific knowledge, student-generated sources of evidence, prioritized criteria, and tradeoff considerations.

2. Adjust watering schedule using historical index - Compare, integrate and evaluate sources of information presented in different media or formats in order to address a scientific question or solve a problem. Visual displays to clarify claims and findings.

1. Inspect irrigation systems - When evaluating solutions it is important to take into account a range of constraints including cost, safety, reliability and aesthetics and to consider social, cultural and environmental impacts.

The following Crosscutting Concepts can easily be worked into these actions. Contact your King County Green Schools Program representative for assistance.

- Patterns of performance of designed systems can be analyzed and interpreted to reengineer and improve the system.
- Systems can be designed for greater or lesser

Common Core alignment

Level Three - Water Conservation and Pollution Prevention

High School



English Language Arts - Speaking and Listening

Education and Outreach – Share water conservation or pollution prevention facts, Teach others about stormwater and/or wastewater

CCSS.ELA-LITERACY.SL.9-12.4

Present information, findings, and supporting evidence clearly, concisely, and logically such that listeners can follow the line of reasoning.

CCSS.ELA-LITERACY.SL.9-12.5

Make strategic use of digital media in presentations to enhance understanding of findings, reasoning, and evidence and to add interest.

Mathematics

Assess and Monitor – Track the school's water use

CCSS.MATH.CONTENT.HSN.Q.A.1

Use units as a way to understand problems and to guide the solution of multi-step problems; choose and interpret units consistently in formulas; choose and interpret the scale and the origin in graphs and data displays.

CCSS.MATH.CONTENT.HSN.Q.A.3

Choose a level of accuracy appropriate to limitations on measurement when reporting quantities.

English Language Arts - Speaking and Listening

Education and Outreach – Share water conservation or pollution prevention facts, Teach others about stormwater and/or wastewater

CCSS.ELA-LITERACY.RST.9-12.1

Cite specific textual evidence to support analysis of science and technical texts.

CCSS.ELA-LITERACY.RST.9-10.2

Determine the central ideas or conclusions of a text; trace the text's explanation or depiction of a complex process, phenomenon, or concept; provide an accurate summary of the text.

CCSS.ELA-LITERACY.RST.11-12.2

Determine the central ideas or conclusions of a text; summarize complex concepts, processes, or information presented in a text by paraphrasing them in simpler but still accurate terms.

CCSS.ELA-LITERACY.RST.9-10.7

Translate quantitative or technical information expressed in words in a text into visual form and translate information expressed visually or mathematically into words.

Mathematics

Education and Outreach - extension ideas

CCSS.MATH.CONTENT.HSA.CED.A.1

Create equations and inequalities in one variable and use them to solve problems.

CCSS.MATH.CONTENT.HSS.ID.A.2

Use statistics appropriate to the shape of the data distribution to compare center and spread of two or more different data sets.

CCSS.MATH.CONTENT.HSS.ID.B.6

Represent data on two quantitative variables on a scatter plot, and describe how the variables are related.

CCSS.MATH.CONTENT.HSS.IC.B.4

Use data from a sample survey to estimate a population mean.

CCSS.MATH.CONTENT.HSS.IC.B.5

Use data from a randomized experiment to compare two treatments; use simulations to decide if differences between parameters are significant.



King County

Department of
Natural Resources and Parks
Solid Waste Division