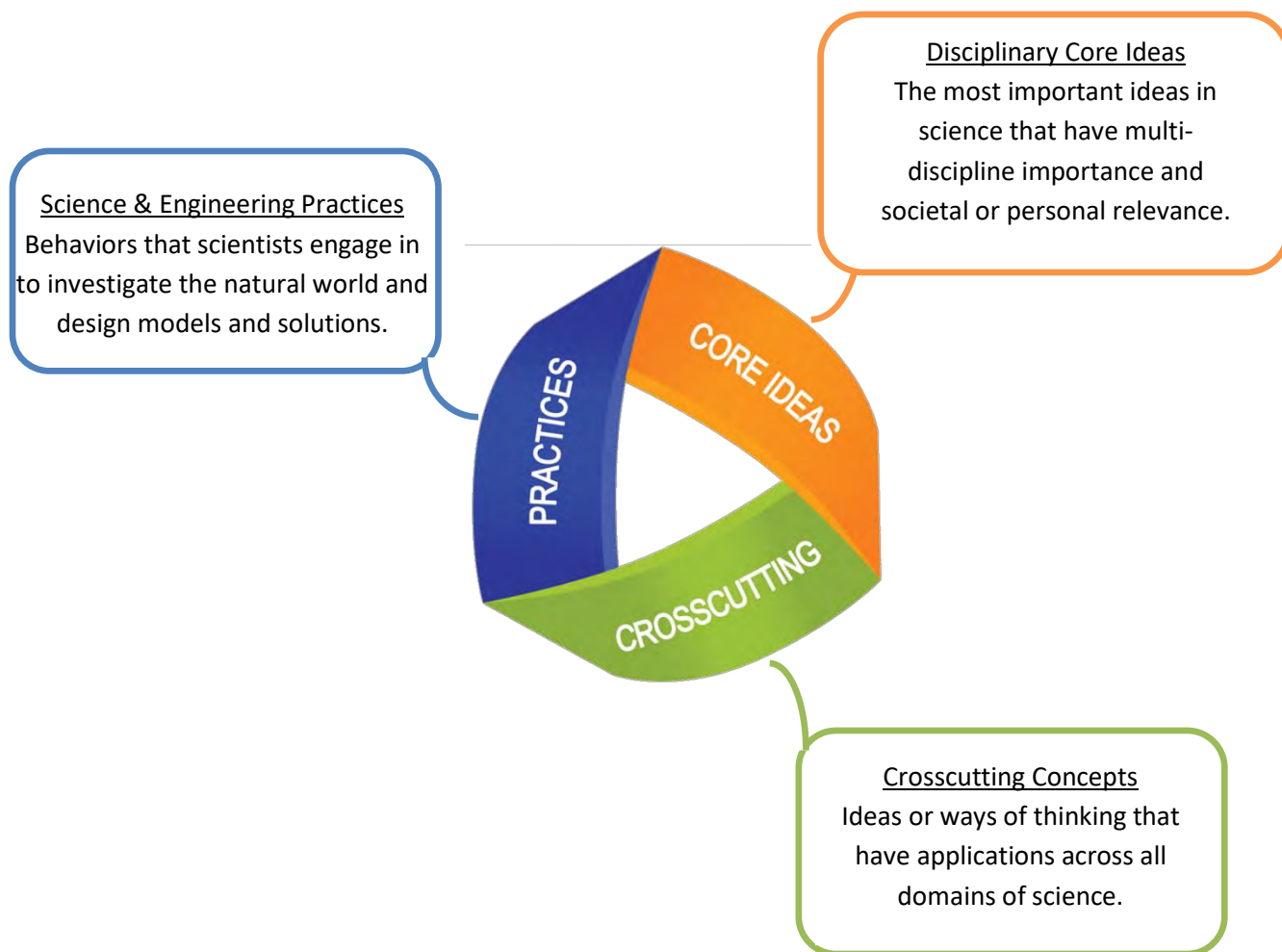




***Next Generation Science Standards and Common Core alignment with
King County Level One Waste Reduction and Recycling Best Practices Guide
Middle School***

Next Generation Science Standards (NGSS) Categories



Level One - Waste Reduction and Recycling

Middle School

The connections between the **Next Generation Science Standards** (NGSS) and **King County Level One 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, “*3. Waste Audit*” on page 3 is for schools that choose #3 in the Education and Outreach section of the Best Practices Guide as one of their Level One actions.

Assess and Monitor section of Best Practices Guide

- Define a design problem that can be solved through the development of a process or system.
- Collect data about the performance of a proposed process, or system under a range of conditions.
- Apply mathematical concepts and/or processes (such as ratio, rate, and percent) to problems.

- The more precisely a design task’s criteria and constraints can be defined, the more likely it is that the designed solution will be successful.
- Sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors
- The iterative process of testing and modifying solutions leads an optimal solution.

- Cause and effect relationships may be used to predict phenomena in natural or designed systems.
- Small changes in one part of a system might cause large changes in another part.

Education and Outreach section of Best Practices Guide

- Communicate technical information (e.g. about a proposed process or system) in writing and/or through oral presentation.

3. Waste Audit, 5. Quiz Show, 7. Skit or Video - Construct, use, and/or present an oral and written argument supported by empirical evidence and scientific reasoning to support a solution to a problem.

11. Integrate into classroom lessons. • Ask questions that can be investigated within the scope of the classroom, outdoor environment, and other public facilities with available resources.

- Conduct an investigation to produce data to serve as the basis for evidence.
- Construct, analyze, and/or interpret graphical displays of data.
- Apply scientific ideas and/or evidence to construct, an explanation for real world phenomena.
- Critically read scientific text to determine technical information to describe patterns in the natural and designed world(s).

- Typically as human populations and per-capita consumption of natural resources increase, so do the negative impacts on Earth unless the activities and technologies involved are engineered otherwise.

- Human activities, such as the release of greenhouse gases are major factors in climate change. Our knowledge, decisions and activities can reduce our vulnerability.

11. Integrate into classroom lessons or 12. Guest speakers • In any ecosystem, organisms and populations with similar requirements may compete with each other for limited resources.

- Growth of organisms and population increases are limited by access to resources.
- Transfers of matter into and out of the physical environment occur at every level. Decomposers recycle nutrients from dead plant or animal matter.
- Changes in biodiversity can influence humans' resources as well as ecosystem services that humans rely on.

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

- Systems may interact with other systems; they may have sub-systems and be a part of larger complex systems.
- Systems in dynamic equilibrium are stable due to a balance of feedback mechanisms.

Waste Reduction and Recycling section of Best Practices Guide

- Undertake a design project, engaging in the design cycle, to construct and/or implement a solution that meets specific design criteria and constraints.

- Optimize performance of a design by prioritizing criteria, making tradeoffs, testing, revising, and retesting.

- A solution needs to be tested, and then modified on the basis of the test results, in order to improve it.

- There are systematic processes for evaluating solutions with respect to how well they meet criteria and constraints of a problem.

- Sometimes parts of different solutions can be combined to create a solution that is better than any of its predecessors.

- The iterative process of testing the most promising solutions and modifying what is proposed on the basis of the test results leads to greater refinement and ultimately to an optimal solution.

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

- Models can be used to represent systems and their interactions—such as inputs, processes and outputs—and energy, matter, and information flows within systems.

- Matter is conserved because atoms are conserved in physical and chemical processes.

- Structures can be designed to serve particular functions by taking into account properties of different materials, and how materials can be shaped and used.

Common Core alignment

Level One - Waste Reduction and Recycling

Middle School



English Language Arts - Speaking and Listening

Education and Outreach – Present a short training

CCSS.ELA-LITERACY.SL.6-8.4

Present claims and findings, sequencing ideas logically and using pertinent descriptions, facts, and details to accentuate main ideas or themes; use appropriate eye contact, adequate volume, and clear pronunciation.

CCSS.ELA-LITERACY.SL.6-8.5

Include multimedia components (e.g., graphics, images, music, sound) and visual displays in presentations to clarify information.

CCSS.ELA-LITERACY.SL.6-8.6

Adapt speech to a variety of contexts and tasks, demonstrating command of formal English when indicated or appropriate.

Mathematics

Assess and Monitor – Calculate school's recycling rate

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

Find a percent of a quantity as a rate per 100.

CCSS.MATH.CONTENT.7.RP.A.3

Use proportional relationships to solve multistep ratio and percent problems.

CCSS.MATH.CONTENT.6.NS.B.3

Fluently add, subtract, multiply, and divide multi-digit decimals using the standard algorithm for each operation.

CCSS.MATH.CONTENT.7.NS.A.3

Solve real-world and mathematical problems involving the four operations with rational numbers.

English Language Arts - Speaking and Listening

Education and Outreach – Include WRR in lessons

CCSS.ELA-LITERACY.RST.6-8.7

Integrate quantitative or technical information expressed in words in a text with a version of that information expressed visually (e.g., in a flowchart, diagram, model, graph, or table).

CCSS.ELA-LITERACY.RST.6-8.8

Distinguish among facts, reasoned judgment based on research findings, and speculation in a text.

CCSS.ELA-LITERACY.RST.6-8.9

Compare and contrast the information gained from experiments, simulations, video, or multimedia sources with that gained from reading a text on the same topic.

Mathematics

Education and Outreach and Waste Reduction - extension ideas

CCSS.MATH.CONTENT.6.EE.B.5

Understand solving an equation or inequality as a process of answering a question.

CCSS.MATH.CONTENT.6.EE.B.6

Use variables to represent numbers and write expressions when solving a real-world or mathematical problem.

CCSS.MATH.CONTENT.7.EE.B.4

Use variables to represent quantities in a real-world or mathematical problem.

CCSS.MATH.CONTENT.8.G.C.9

Know the formulas for the volumes of cones, cylinders, and spheres and use them to solve real-world and mathematical problems.

CCSS.MATH.CONTENT.8.SP.A.4

Construct and interpret a two-way table summarizing data on two categorical variables collected from the same subjects.



King County

Department of
Natural Resources and Parks
Solid Waste Division