SAN MATEO COUNTY Sustainability Department	**The 4R's Sorting Activity** GRADE BAND: 1ST - 5TH	

Standards and Topic Connections:

One Planet Topic	Standards: Next Generation Science	Environmental Principles and Concepts (EP&Cs)
Consumption and Waste	**Performance Expectations (PE):** Science and Engineering Practices (SEP) Disciplinary Core Ideas (DCI) and Crosscutting Concepts (CC)	**Principle IV** **Principle V**
	K-2-ETS1-1 Engineering Design: **Ask questions, make observations, and gather information about a situation people want to change** to define a simple problem that can be solved through the development of a new or improved object or tool. ESS3.A Natural Resources How do humans depend on Earth's resources? ESS3.C Human Impact on Earth Systems How do humans change the planet?	**Principle IV** The exchange of matter between natural systems and human societies affects the long-term functioning of both. **Principle V** Decisions affecting resources and natural systems are based on a wide range of considerations and decision-making processes.

Purpose / Learning Objectives:

Every student will be able to...

- Name 2 ways to divert waste from the landfill: compost and recycle.
- Identify material properties that make a common item acceptable to compost.
- Identify material properties that make a common item acceptable to recycle.
- Identify several items that cannot be recycled or composted but must be landfilled instead.

Driving / Essential Question(s):

- How can people re-use waste?
- How does recycling help people re-use waste?
- How does compost/rot help people re-use waste?
- Why do people need to send less waste to the landfill?
- How can people make sure more waste is re-used and less waste is sent to the landfill ?

Lesson Terms / Academic Vocabulary:

- Waste
- Garbage
- Compost
- Recycle
- Rot
- Environment
- Raw materials
- Natural Resources
- Renewable resource
- Nonrenewable resource

Materials / Technology:

- The 4R's Sorting Activity Student Worksheet
- Scissors
- Glue

Agenda / Activities:

Utilize the 5E Model - *Engage, Explore, Explain, Extend/Elaborate, Evaluate*
The purpose of this lesson is to have students practice sorting everyday classroom items into the right waste sorting bins: recycle, compost or landfill.

10 minutes	**Engage**: Access prior knowledge by asking students when and where they've noticed that there are separate bins or specific directions to separate and sort waste. At home? At a movie theater? At a prior school? How did they learn what went where? Were there different color bins? Pictures that helped show what items were acceptable or not? **Explain:** When clean paper is sorted by people in a recycling bin, this is actually the first step toward that paper being re-made into new paper (after many more steps of course). This simple action helps to reduce the number of trees cut to make new paper. If clean paper is thrown carelessly into the trash or landfill bin, no one can ever re-use that paper to make new paper again which means people would have to cut trees to make paper again. Recycling helps to reduce the amount of natural resources extracted from the Earth. Placing organic waste (food scraps, yard waste and food-soiled paper) into the compost bin is the first step that helps people re-use waste by allowing the natural processes (decomposition) that break down organic waste to take place to make soil. The composting process for cities is done at a large scale at nearby commercial composting facilities. California has laws that tell cities to plant to use more waste as resources and in this way, send less waste to the landfill.The first step to doing so is teaching everyone which types of waste can be re-used. There are many ways to do this: designate different colored bins (blue for recycling, green/brown for composting), make signage that tells people what waste goes in which bin, and teach everyone to save our own waste from being buried forever in landfills that take up a lot of space and habitat. **Did You Know:** ● A head of lettuce (organic waste) can take up to 25 years to break down in a landfill but in a compost pile, that same head of lettuce will be broken down into soil by microorganisms (decomposers) in a matter of weeks.

	• It takes 70% less energy to make paper from the recycling bin than to make new paper from trees.
15 minutes:	Refer to student worksheet (SW) below 1) Print and give students page 1 and 2 of SW. If students will be doing the activity at home, all 4 pages can be printed. 2) Instruct students that they will be sorting common everyday items into separate waste categories: Recycling, Compost and Landfill. 3) Before cutting all the squares on page 2, review recycling rules as a class: paper, cardboard, glass, aluminum and steel food and beverage cans, and Plastics with a 1 and 2 inside the chasing arrows symbol that are clean, empty and dry are acceptable recycling. Next, review composting rules as a class: food, fruit and vegetable scraps, yard waste and food soiled paper. All wastes that don't fit into the recycling or composting rules go to landfill. 4) After discussing many items, ask students if there are any items that seem confusing. These may include the plastic bag, the juice box and pouch, the milk carton or the greasy pizza box. There is more information in the answer key to give more facts as to why those items can or cannot be recycled or composted, or must go to landfill. 5) Once the group discussion is over, have students cut and paste all the items on page 2 into the correct sorting "bins" on page 1. Allow students to discuss any questions with their peers so they get a chance to practice remembering and communicating the rules of waste sorting to each other.
(5-10 min)	**Extend:** Students may notice that there are many more items in the landfill bin. Encourage students to discuss ways to reduce the types of trash that go to the landfill. For example, is it possible to not use juice boxes or pouches? How? If we can't replace the juice box or pouch, can we replace it with something else or buy less of it? Making less waste in the first place is an even better way to re-use what we already have in favor of buying single-use items, like plastic utensils or straws, that will only be used once and then thrown away.

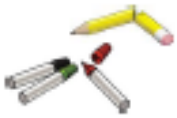
After Completion of the Activity:	Follow up exercises can include discussions on growing everyday awareness, practice and consistency of simple waste sorting habits that enable us to re-use and “save our waste!” instead of throwing it away.

The 4R’s Sorting Activity Student Worksheet can be accessed through this LINK
The 4R’s Sorting Activity Student Worksheet, Spanish version, can be accessed through this LINK
The 4R’s Sorting Activity Student Worksheet below is embedded in this document as a teacher reference only.

Recycle	Compost	Landfill

Name _____

Cut out all the waste items and sort them into the correct columns on page 1

Clean Paper 	Empty Plastic, Can or Glass Bottle 	Used Tissue or Kleenex 	Band-Aid 	Greasy Pizza Box 
Clean Aluminum Foil 	Plastic Bag 	Broken Pencils, Dried Out Markers 	Juice Box or Pouch 	Chip Bag 
Food Scraps 	Candy Wrappers 	Plastic Utensils 	To Go Cups and Plastic Straws And Lids 	Used Napkins or Paper Towels 
Styrofoam Cup 	Leaves and Grass 	Empty Milk Carton 	Used Paper Food Tray 	Wipes and Cleaning Wipes 

ZERO WASTE EDUCATION – OOS SCHOOLS PROGAM

4R's Sorting Activity

Background: Not all waste goes in the same bin! In most homes, apartments, schools and businesses in the County of San Mateo, you will see three bins labeled Recycling, Compost and Landfill. They help us make less waste by sorting out resources that would otherwise go to the landfill!

Lesson: Here are some rules to help you consider before you place an item into a bin category:

- ***Items placed in the recycle column** should be clean, empty and dry. For example, a used paper food tray may be made from paper, but when it becomes greasy and has food on it, it can no longer be recycled.*
- ***Items placed in the compost column** should be items that grew from a plant or tree. Hint: Napkins, paper towels, and cardboard come from trees but if they have food or grease stains they must go in the compost bin.*
- ***All items that don't follow the recycling or composting rules go in the landfill column.** This includes most items made of plastic. Items that have body fluids, germs or cleaning solutions should always go in the landfill.*

Directions:

1) Cut out all the waste items from Page 2
2) Sort and paste the waste items into the correct categories on Page 1

Answer Key

Read under the answer key for more interesting facts about the items.

Recycle	Compost	Landfill
• Clean Paper • Aluminum Foil • Empty Plastic, Can, or Glass Bottle • Empty Milk Carton*	• Greasy Pizza Box** • Food Scraps • Used Napkins and Paper Towels • Leaves and Grass • Food Paper Tray	• Used Tissue or Kleenex • Band-Aid • Plastic Bag*** • Broken Pencils, Dried Out Markers • Juice Boxes and Pouches**** • Chip Bag • Candy Wrappers • Plastic Utensils • To Go Cups, Straws and Lids • Styrofoam Cup • Wipies and Cleaning Wipes

*If a milk carton is not empty when placed in the recycling bin, its contents will spill all over the rest of the recycling, possibly ruining them.

**Never put a greasy pizza box in the recycling bin, it will contaminate the clean paper.

***Plastic bags should never go into the recycling cart. They are sometimes accepted at the grocery stores. Better yet, reuse them over and over.

****Juice boxes do have cardboard, but they also have plastic and aluminum which can't be unglued to be recycled or composted.

The County of San Mateo Office of Sustainability Schools Program seeks to inspire students to take action to conserve resources in their schools and communities. Please visit our website for more information about our programs: https://www.smcsustainability.org/waste-reduction/education-schools/

For more information about Waste Reduction programs in the County, please reach out to us at: sustainability@smcgov.org

Waste	Waste is defined as any item which is discarded after its primary use, or is deemed worthless, defective or of no use.
Garbage	Garbage is defined as waste that is sent to a landfill and items that never break down or will be used again.

Compost	Compost is defined as waste that is made of organic material that can be added to soil to help plants grow. Examples: Yard trimmings and food scraps.
Recycle	Recycle is defined as waste items that can be melted down and reformed into new items of the same material. Examples: Plastic items and metal items.
Rot	Rot is defined as the process in which organic waste items (compost) are breaking down into the basic nutrients soil needs to make plants grow.
Environment	The air, water, soil, minerals, organisms, and all other factors surrounding an organism.
Raw Materials	Raw materials are defined as the basic materials that are used to produce goods, finished products, energy, or intermediate products that are needed for finished products. Examples:
Natural Resources	Materials or substances such as minerals, forests, water, and fertile land that occur in nature and can be used for economic gain. Examples of natural resources: water, air, coal, oil, natural gas, phosphorus, iron, other minerals.
Renewable Resource	A renewable resource is a natural resource which will replenish to replace the depleted portion by consumption or usage. Examples: forests of trees grow back over time but cannot always keep up with the level of consumption by the human race.
Non-renewable Resource	A non-renewable resource is a natural resource that does not replenish to replace the depleted portion after consumption or usage. The