



NGSS – WASTE REDUCTION – ALL GRADES

Grade Level

Kindergarten

NGSS Standard (performance expectation) Related Lesson Activities

<p><u>K-LS1-1: Use observations to describe patterns of what plants and animals (including humans) need to survive.</u></p>	<ul style="list-style-type: none"> - Discussion of the conditions of a landfill: dirt and trash are packed so tightly that there's no air for plants and animals
<p><u>K-ESS2-2: Construct an argument supported by evidence for how plants and animals (including humans) can change the environment to meet their needs.</u></p>	<ul style="list-style-type: none"> - Discussion of the landfill, the impact it has on the landscape. - Students discuss alternatives and come to the conclusion that this is a necessary, but not ideal, way to dispose of our trash.
<p><u>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.</u></p>	<ul style="list-style-type: none"> - Discussion of human impacts on the land: landfill construction, harvesting of natural resources, processing of natural resources into products, and emissions from landfills - Solutions discussed, focusing on the 3 R's. - Reuse game: students examine different materials and come up with ways to reuse them to help reduce our waste.
<p><u>K-2-ETS1-1: 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.</u></p>	<ul style="list-style-type: none"> - Students create solutions to the amount of waste we create and how it is disposed of. Potential ideas for tools include reusable products. These products can be considered as improvements on existing products in that they help solve the problem of excessive waste. - Reuse game: students examine different materials and come up with ways to reuse them to help reduce our waste.

Grade Level

1st grade

NGSS Standard (performance expectation) Related Lesson Activities

K-2-ETS1-1: 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.

- Students create solutions to the amount of waste we create and how it is disposed of (landfills). Potential ideas for tools include reusable products such as bags, straws, and water bottles. These products can be considered as improvements on existing products in that they help solve the problem of excessive waste.
- Reuse game (Waste Reduction)– students examine different materials and come up with ways to reuse them to help reduce our waste.
- Creative Reuse craft (AFS trip)-students use reuse materials from the AFS store for arts and crafts, learning to be creative with ways to reuse objects that would otherwise become trash

Grade Level

2nd

NGSS Standard (performance expectation) Related Lesson Activities

2-PS1-1: Plan and conduct an investigation to describe and classify different kinds of materials by their observable properties.

- Classification of materials as recyclable or not based on various properties, such as:
 - The sound they make when manipulated (crinkle vs not) and their thickness.
 - Material type
 - Size
 - Cleanliness

<p><u>2-PS1-2: Analyze data obtained from testing different materials to determine which materials have the properties that are best suited for an intended purpose.* Examples of properties could include, strength, flexibility, hardness, texture, and absorbency.</u></p>	<ul style="list-style-type: none"> - Classification of materials as recyclable or not based on various properties, such as: <ul style="list-style-type: none"> - The sound they make when manipulated (crinkle vs. not) and their thickness. - Material type - Size - Cleanliness
<p><u>2-ESS1-1: Use information from several sources to provide evidence that Earth events can occur quickly or slowly. Examples of events and timescales could include volcanic explosions and earthquakes, which happen quickly and erosion of rocks, which occurs slowly.</u></p>	<ul style="list-style-type: none"> - Discussion of the timescales of breakdown/decomposition for different products such as plastic and paper - Discussion of the timescales of creation of natural resources including trees, sand, and oil
<p><u>K-2-ETS1-1: 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.</u></p>	<ul style="list-style-type: none"> - Discussion of reusable everyday items as a solution to waste less trash including reusable bags, straws, and water bottles - Inquiry for new student inventions to reduce waste. Potential examples include reusing jars as bird feeders or cups, and other repurposing ideas. <ul style="list-style-type: none"> - Reuse game (Waste Reduction)– students examine different materials and come up with ways to reuse them to help reduce our waste.

Grade Level

3rd grade

NGSS Standard (performance expectation) Related Lesson Activities

<p><u>3-LS4-4: Make a claim about the merit of a solution to a problem caused when the environment changes and the types of plants and animals that live there may change</u></p>	<ul style="list-style-type: none"> - Land cover (trees, grass) is cleared to construct landfills. <ul style="list-style-type: none"> - “Do you think rabbits or beautiful song birds live at a landfill?” - “The landfill is a big patch of dirt with trash buried beneath, what kinds of animals do you think live there?” - “Pest animals, like rats, and some birds, like seagulls, are attracted to the landfill.”
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	<ul style="list-style-type: none"> - “There are actually so many seagulls that go to the landfill that they need to bring in falcons to chase the seagulls away!”
<p><u>3-5-ETS1-2: Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem</u></p>	<ul style="list-style-type: none"> - Problem: our landfills are filling up too quickly and we will soon need to dig new landfills - Solutions: students discuss various ways they can use the 3 R’s - Compare: the 3 R’s are ordered by how effective they are in reducing trash

Grade Level

4th

NGSS Standard (performance expectation) Related Lesson Activities

<p><u>3-5-ETS1-2: Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem</u></p>	<ul style="list-style-type: none"> - Problem: our landfills are filling up too quickly, and we will soon need to dig new landfills - Solutions: students discuss various ways they can use the 3 R’s - Compare: the 3 R’s are ordered by how effective they are in reducing trash
<p><u>4-ESS3-1: Obtain and combine information to describe that energy and fuels are derived from natural resources and their uses affect the environment.</u></p>	<ul style="list-style-type: none"> - Natural resources matching game as well as discussion of materials and energy needed to process them into products - Renewable vs. nonrenewable resources - Discussion of oil, how long it takes to form, and what we use it for (gas, oil, plastic, etc.) - Habitat loss due to landfill creation, alternatives to trash generation. Alternatives to landfills discussed
<p><u>4-ESS2-2: Analyze and interpret data from maps to describe patterns of Earth’s features</u></p>	<ul style="list-style-type: none"> - View of the landfill from above, point out features of area surrounding the landfill such as the mountain range, ocean, roads, and cities/towns

Grade Level

5th

NGSS Standard (performance expectation) Related Lesson Activities

<p><u>5-ESS3-1: Obtain and combine information about ways individual communities use science ideas to protect the Earth's resources and environment</u></p>	<ul style="list-style-type: none">- Using the 3 R's in everyday life stops trash from going to landfills which, prevents future landfills from being created (saves trees, habitat, etc.)- 3 R's helps people to buy fewer goods (reduce, reuse) and fewer new products are made (recycle): conserves natural resources- Discussion of new ReSource center at the landfill which is able to divert ~60% of waste in Santa Barbara County
<p><u>3-5-ETS1-2: Generate and compare multiple possible solutions to a problem based on how well each is likely to meet the criteria and constraints of the problem</u></p>	<ul style="list-style-type: none">- Problem: our landfills are filling up too quickly and we will soon need to dig new landfills- Solutions: students discuss various ways they can use the 3 R's- Compare: the 3 R's are ordered by how effective they are in reducing trash

Grade Level

6th

NGSS Standard (performance expectation) Related Lesson Activities

<p><u>MS-ESS3-3: Apply scientific principles to design a method for monitoring and minimizing a human impact on the environment</u></p>	<ul style="list-style-type: none">- Impact (land usage) = digging new landfills which destroys habitats/contributes to pollution, new products require natural resources- Examining = through observation, students learn that digging new landfills destroys natural habitat. Students also learn that buying a brand-new product every time they buy something requires natural resources to be taken from the environment- Solutions = 3 R's are used to slow down the filling of our landfills and prevent
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	<p>natural resources to be taken from the environment to make new products</p> <ul style="list-style-type: none"> - Rot (compost) can also be discussed as a solution to prevent food waste from filling up landfills
<p><u>MS-PS1-3: Gather and make sense of information to describe that synthetic materials come from natural resources and impact society.</u></p>	<ul style="list-style-type: none"> - Natural resources game and ensuing discussion - Plastic originating from oil is a non-renewable resource that we cannot make more of and should therefore conserve - Plastic does not decompose and will remain in the environment indefinitely, therefore we should reduce our use of plastic and dispose of it properly - Additional societal impacts include building additional landfills and creating recycling programs