### Unwasted: Lesson 1

| Lesson objectives: |
| --- |
| Students will be able to: * Identify different types of energy sources
* Categorize energy sources as renewable or nonrenewable
* Explain the basic concepts of renewable and nonrenewable energy sources
 |
| Assessment: |
| * Exit questions
* Classwork
 |
| Key Points: |
| * What is Nonrenewable and Renewable Energy?
* Identify the differences between energy sources.
 |
| Component: | Teacher & Student Actions | Materials |
| Do Now  | Do now: Think, pair, share discussing energy sources used daily  | Slidedeck Paper and pencil (or discuss out loud as a class) |
| Introduction of Unwasted | * Introduce unit expectations, assignments, and schedule
* Distribute and discuss the Note to Students
 | Slides [Note to Students](https://docs.google.com/document/d/1LgwyzIrSQY_rN1m1oPCr_IXG6KBVmLPzZq2IZMn-QOM/edit?usp=sharing) |
| Mini-Lesson | * Introduction of renewable and nonrenewable energy
 | Slides |
| Independent Practice  | * Energy Source Sort - Categorize the different energy sources and subsequent examples as renewable and nonrenewable using the provided handout.
 | [Lesson Handout](https://docs.google.com/document/d/18lo68LwqUIpnrJifKUQyLtSErpsQVWbg1017wHtB4Yo/edit?usp=sharing)  |
| Closing | * Complete the “I Think, Prove It” section on the lesson handout to explain what you think about renewable and nonrenewable energy resources.
* Ask students to complete Daily learning log
 | [Daily Learning Log](https://drive.google.com/file/d/1aq72zb87RPtjOa5yCj2MxxL3HlMmn43u/view?usp=sharing)  |
| Differentiation Considerations: |
| * Group seating
* Popcorn reading (can assign students parts of the reading and allow for review before reading out loud)
* Students or groups can have extra teacher-support where needed
* Previewing comprehension questions before reading the article
* Use of additional models of the solar system
 |
| **Standard(s):** |
| **Next Generation Science Standards (NGSS)*** **MS-ESS3-1.** Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.

**Common Core Standards*** [**CCSS.ELA-LITERACY.W.6-12.10**](https://www.thecorestandards.org/ELA-Literacy/W/6/10/) Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.
* **CCSS.ELA-LITERACY.SL.6-12.1** Engage effectively in a range of collaborative discussions (one-on-one, in groups, and teacher-led) with diverse partners on grade 6-12 topics, texts, and issues, building on others' ideas and expressing their own clearly.
 |

### Unwasted: Lesson 2

| Lesson objectives: |
| --- |
| * Define nonrenewable energy resources
* Explore the advantages and disadvantages of nonrenewable energy resources
 |
| Assessment: |
| * Exit questions
* Classwork
 |
| Key Points: |
| * Learning about non-renewable energy. Both advantages and disadvantages.
* Notice and Wonder activity
 |
| Component: | Teacher & Student Actions | Materials |
| Do Now  | * Do Now: Create a list of at least three reasons people use nonrenewable energy resources.
 | Slide deckPaper and pencil (or discuss out loud as a class)  |
| Mini-Lesson | * Discuss examples of nonrenewable energy sources, advantages, disadvantages, etc.
 | Slides |
| Independent Practice  | * Distribute the [lesson handout](https://docs.google.com/document/d/18lo68LwqUIpnrJifKUQyLtSErpsQVWbg1017wHtB4Yo/edit?usp=sharing)
* Watch the video provided and ask students to answer the questions in the lesson handout
 | [Lesson Handout](https://docs.google.com/document/d/18lo68LwqUIpnrJifKUQyLtSErpsQVWbg1017wHtB4Yo/edit?usp=sharing) |
| Closing | * Complete the Notice and Wonder exit ticket
* Ask students to complete Daily learning log
 | [Daily Learning Log](https://drive.google.com/file/d/1aq72zb87RPtjOa5yCj2MxxL3HlMmn43u/view?usp=sharing)  |
| Differentiation Considerations: |
| * Group seating
* Popcorn reading (can assign students parts of the reading and allow for review before reading out loud)
* Students or groups can have extra teacher-support where needed
* Previewing comprehension questions before reading the article
 |
| **Standard(s):** |
| **Next Generation Science Standards (NGSS)*** **MS-ESS3-4.** Construct an argument supported by evidence for how increases in human population and per-capita consumption of natural resources impact Earth's systems.
* **MS-ESS3-1.** Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
* **MS-ESS3-5.** Ask questions to clarify evidence of the factors that have caused the rise in global temperatures over the past century.

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### Unwasted: Lesson 3

| Lesson objectives: |
| --- |
| * Define renewable resources
* Explore the advantages and disadvantages of renewable resources
 |
| Assessment: |
| * Exit questions
* Classwork
 |
| Key Points: |
| * Renewable energy sources, like solar and wind, provide sustainable power and reduce pollution.
 |
| Component: | Teacher & Student Actions | Materials |
| Do Now  | * Do Now: Write down everything you already know about renewable energy resources.
 | Slidedeck Paper and pencil (or discuss out loud as a class)  |
| Mini-Lesson | * Discuss examples of renewable energy sources, advantages, disadvantages, etc.
 | Slides |
| Independent Practice | * Students will build either a windmill or water wheel
* Provide allowed materials for students
* You can choose for students or allow students to choose between the two options
* Students can draw a design of their build on the handout
 | [Lesson Handout](https://docs.google.com/document/d/18lo68LwqUIpnrJifKUQyLtSErpsQVWbg1017wHtB4Yo/edit?usp=sharing) |
| Closing | * Complete Exit Ticket
* Ask students to complete Daily learning log
 | [Daily Learning Log](https://drive.google.com/file/d/1aq72zb87RPtjOa5yCj2MxxL3HlMmn43u/view?usp=sharing)  |
| Differentiation Considerations: |
| * Group seating
* Popcorn reading (can assign students parts of the reading and allow for review before reading out loud)
* Students or groups can have extra teacher-support where needed
 |
| **Standard(s):** |
| **Next Generation Science Standards (NGSS)*** **MS-ESS3-1.** Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.
* **MS-ETS1-4.** Develop a model to generate data for iterative testing and modification of a proposed object, tool, or process such that an optimal design can be achieved.

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### Unwasted: Lesson 4

| Lesson objectives: |
| --- |
| * Describe unconventional types of renewable energy
 |
| Assessment: |
| * Exit questions
* Classwork
 |
| Key Points: |
| * Exploring unconventional energy sources can lead to innovative solutions for sustainable energy, reducing reliance on nonrenewable sources.
 |
| Component: | Teacher & Student Actions | Materials |
| Do Now  | * Do Now: Try to guess the energy source is based on the clues below. Write your guess on your handout.
* Clue 1: This energy source can be found in your kitchen.
* Clue 2: It comes from something we often throw away after meals.
* Clue 3: It can be used to create fuel for cars or even generate electricity.
 | Slides [Lesson Handout](https://docs.google.com/document/d/18lo68LwqUIpnrJifKUQyLtSErpsQVWbg1017wHtB4Yo/edit?usp=sharing) |
| Mini-Lesson | * [Play Renew-A Bead Game](https://www.teachengineering.org/activities/view/cla_activity1_renewable)
* Introduce unconventional energy sources, such as the Piezoelectric Dance Floor. Discuss their potential benefits and challenges.
 | Slides |
| Independent/Group Practice | * Design your own unconventional energy resource by drawing it in your handout.
 | [Lesson Handout](https://docs.google.com/document/d/18lo68LwqUIpnrJifKUQyLtSErpsQVWbg1017wHtB4Yo/edit?usp=sharing) |
| Closing | * Complete Exit Ticket
* Ask students to complete Daily learning log
 | [Daily Learning Log](https://drive.google.com/file/d/1aq72zb87RPtjOa5yCj2MxxL3HlMmn43u/view?usp=sharing)  |
| Differentiation Considerations: |
| * Group seating
* Popcorn reading (can assign students parts of the reading and allow for review before reading out loud)
* Students or groups can have extra teacher-support where needed
 |
| **Standard(s):** |
| **Next Generation Science Standards (NGSS)*** **MS-ESS3-1.** Construct a scientific explanation based on evidence for how the uneven distributions of Earth's mineral, energy, and groundwater resources are the result of past and current geoscience processes.

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### Unwasted: Lesson 5

| Lesson Objectives: |
| --- |
| * Design and build a new energy resource using allowed materials
 |
| Assessment: |
| * Exit questions
* Classwork
 |
| Key Points: |
| * Designing and building a new energy source for a sustainable future, and innovative thinking can help address environmental challenges.
 |
| Component: | Teacher & Student Actions | Materials |
| Do Now  | * Do Now: Would you rather use only renewable energy resources or nonrenewable energy resources forever?
 | Slides[Lesson Handout](https://docs.google.com/document/d/18lo68LwqUIpnrJifKUQyLtSErpsQVWbg1017wHtB4Yo/edit?usp=sharing) |
| Mini-Lesson | * Introduce BreakFree contest challenge to students

You’ve been tasked with building a new energy resource! Students will* Design a new energy resource
* Obtain peer feedback
* Share resource with your classmates
* Submit to the BreakFree contest!
 | Slides |
| Independent Practice | * Students will design and build a new renewable energy resource
* Students will pair up and offer feedback to each other based on the “like, wish, wonder” protocol outlined in the slides and in the student handout.
 | [Lesson Handout](https://docs.google.com/document/d/18lo68LwqUIpnrJifKUQyLtSErpsQVWbg1017wHtB4Yo/edit?usp=sharing) |
| Closing | * Ask students to complete Daily learning log
* Complete Exit Ticket by submitting student work to the BreakFree contest.
 | [Daily Learning Log](https://drive.google.com/file/d/1aq72zb87RPtjOa5yCj2MxxL3HlMmn43u/view?usp=sharing)  |
| Differentiation Considerations: |
| * Group seating
* Popcorn reading (can assign students parts of the reading and allow for review before reading out loud)
* Students or groups can have extra teacher-support where needed
 |
| **Standard(s):** |
| **Common Core Standards*** [**CCSS.ELA-LITERACY.W.6-12.10**](https://www.thecorestandards.org/ELA-Literacy/W/6/10/) Write routinely over extended time frames (time for research, reflection, and revision) and shorter time frames (a single sitting or a day or two) for a range of discipline-specific tasks, purposes, and audiences.
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