WEEKLY LESSON PLAN

Renewable Energy & Simple Circuits

Ms. Rachel Kim • Grade 6 — Science / STEM • Week of October 12–16, 2026 • Meridian STEM Academy

Weekly Overview

Essential Question

How can engineers design a device that converts a renewable energy source into usable electrical energy to solve a real-world problem?

Learning Targets — I can…

- explain how energy transforms from one form to another within a circuit
- distinguish renewable from nonrenewable sources and evaluate trade-offs
- apply the engineering design process to build and test a working prototype
- construct and troubleshoot a simple series circuit
- communicate design decisions using labeled diagrams and test data

Standards Alignment

MS-PS3-3 — design, construct, and test a device that transfers energy

MS-ETS1-1 — define criteria and constraints of a design problem

MS-ETS1-2 — evaluate competing design solutions

MS-ETS1-4 — develop a model to generate data for iterative testing

CCSS.ELA WHST.6-8.7 — conduct a short, focused research task

Cross-Curricular Links

Math (energy-cost ratios) • ELA (engineering logs) • Social Studies (energy policy)

Materials & Setup Checklist

Equipment & Tools

- ☐ D-cell batteries & holders (1 per group of 3)
- ☐ Insulated copper wire, pre-stripped, 15 cm lengths
- ☐ Miniature bulbs and sockets, or LEDs with resistors
- ☐ Small DC motors with mini fan blades
- ☐ Multimeters (class set of 6)
- ☐ Alligator-clip test leads

Consumables & Printables

- ☐ Engineering Design Log packets (1 per student)
- ☐ Renewable Energy Source sorting cards
- ☐ Circuit diagram worksheets
- ☐ Friday showcase rubric handout
- ☐ Recycled-materials bin (cardboard, caps, foil)
- ☐ Safety glasses (class set)

Daily Lesson Plans

Monday — Energy Forms & Transfer (Intro)

Objective: Students will explain how energy changes form as it moves through a system, using a circuit as a concrete example.

Standards: MS-PS3-3

Warm-Up (5 min): “Energy Scavenger Hunt” — identify three examples of energy transformation

happening in the classroom right now.

Direct Instruction (15 min): Mini-lecture on potential vs. kinetic vs. electrical energy; teacher demo of a hand-crank generator lighting an LED.

Hands-On Activity (25 min): Station rotation — students test four pre-built circuits (open, closed, short, with resistor) and record observations in the Engineering Log.

Materials: Hand-crank generator, four pre-built circuit stations, Engineering Log packets.

Exit Ticket: One sentence explaining where the energy "went" in the crank-to-light demo.

Differentiation: Sentence starters provided for the exit ticket; advanced students estimate energy lost as heat.

Tuesday — Renewable vs. Nonrenewable Sources

Objective: Students will compare renewable and nonrenewable energy sources and evaluate trade-offs using evidence.

Standards: MS-PS3-3, MS-ETS1-1

Warm-Up: Quick-write: "Name one energy source your home uses. Where do you think it comes from?"

Direct Instruction: Card sort — solar, wind, hydro, geothermal, biomass vs. coal, natural gas, oil; class builds a T-chart of trade-offs (cost, availability, emissions).

Hands-On Activity: Small groups research one renewable source with provided fact sheets and complete a trade-off comparison table.

Materials: Sorting cards, fact sheets, comparison-table handout.

Exit Ticket: Rank three energy sources by "best fit" for a fictional coastal town, with one reason each.

Differentiation: Fact sheets available in simplified-text and extended-detail versions; glossary of key terms for multilingual learners.

Wednesday — Engineering Design Challenge Launch

Objective: Students will define criteria and constraints for a renewable-energy device and generate initial design sketches.

Standards: MS-ETS1-1

Warm-Up: Review the Engineering Design Process poster; pairs sequence the six steps from memory.

Direct Instruction: Introduce the design brief: build a device that uses a renewable source to power a small light or motor for a model streetlight, using only approved materials.

Hands-On Activity: Teams draft a criteria-and-constraints list, then sketch two competing design concepts with labeled parts.

Materials: Design brief handout, recycled-materials bin (preview only), rulers, colored pencils.

Exit Ticket: Team submits one sketch with a one-sentence justification for their leading concept.

Differentiation: Sentence frames for the justification; enrichment groups add a cost/budget constraint to their design.

Thursday — Build & Test Prototypes

Objective: Students will construct a working prototype circuit and collect performance data through iterative testing.

Standards: MS-ETS1-2, MS-ETS1-4

Warm-Up: Safety briefing and materials distribution; review multimeter use.

Direct Instruction: Quick demo measuring voltage and current with a multimeter; troubleshooting checklist (loose connection, dead battery, short).

Hands-On Activity: Teams build their prototype, run three test trials, and log voltage/brightness or motor-speed data on the Prototype Testing Data Sheet.

Materials: Batteries, wire, bulbs/motors, multimeters, alligator clips, recycled housing materials.

Exit Ticket: One documented failure and the fix the team applied.

Differentiation: Pre-wired starter circuits for students needing scaffolding; enrichment teams add a switch or a second load in series or parallel.

Friday — Showcase, Testing & Reflection

Objective: Students will present their device, justify design decisions with test data, and reflect on the engineering process.

Standards: MS-ETS1-2, MS-ETS1-4

Warm-Up: Final ten-minute build/repair window.

Direct Instruction: Mini-lesson on giving effective peer feedback (specific, kind, useful).

Hands-On Activity: Gallery-walk showcase — teams display devices and data sheets; peers leave written feedback using the rubric; teacher circulates for spot-checks.

Materials: Rubric handouts, completed prototypes, Engineering Log packets, sticky notes.

Exit Ticket / Assessment: Individual written reflection — one thing that worked, one thing to redesign, one connection to real-world renewable energy.

Differentiation: Reflection may be typed, handwritten, or dictated to a partner or scribe for students with IEP accommodations.

Assessment Summary

Day	Standard Focus	Formative Check	Summative / Culminating
Monday	MS-PS3-3	Exit slip: energy-transfer diagram	–
Tuesday	MS-PS3-3, MS-ETS1-1	Trade-off comparison table review	–
Wednesday	MS-ETS1-1	Design sketch + justification check	–
Thursday	MS-ETS1-2, MS-ETS1-4	Prototype testing data sheet	–
Friday	MS-ETS1-2, MS-ETS1-4	Gallery-walk peer feedback	Renewable Energy Device showcase + rubric

Differentiation & Support

Support / Intervention

- Pre-wired starter circuits
- Simplified-text fact sheets
- Sentence frames for exit tickets
- Extended time on Friday reflection
- Visual step-by-step build cards

On-Level

- Standard design brief & materials list
- Mixed-readiness triads for collaboration
- Checklist-guided testing protocol
- Standard rubric expectations

Enrichment

- Added budget/cost constraint
- Series-vs-parallel circuit comparison
- Optional brief on a local renewable project
- Mentor role during gallery walk

Homework & Extension

- Interview a family member about one energy-saving habit at home; bring two sentences to share Monday.
- Optional: sketch an alternate streetlight design using a different renewable source.
- Extension reading: one-page article on community solar programs (provided).

Teacher Reflection — End of Week

☐ Objectives met for all groups ☐ Materials were sufficient ☐ Pacing stayed on target

What worked well this week:

What I would change next time:

Notes for next year's Renewable Energy unit:

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