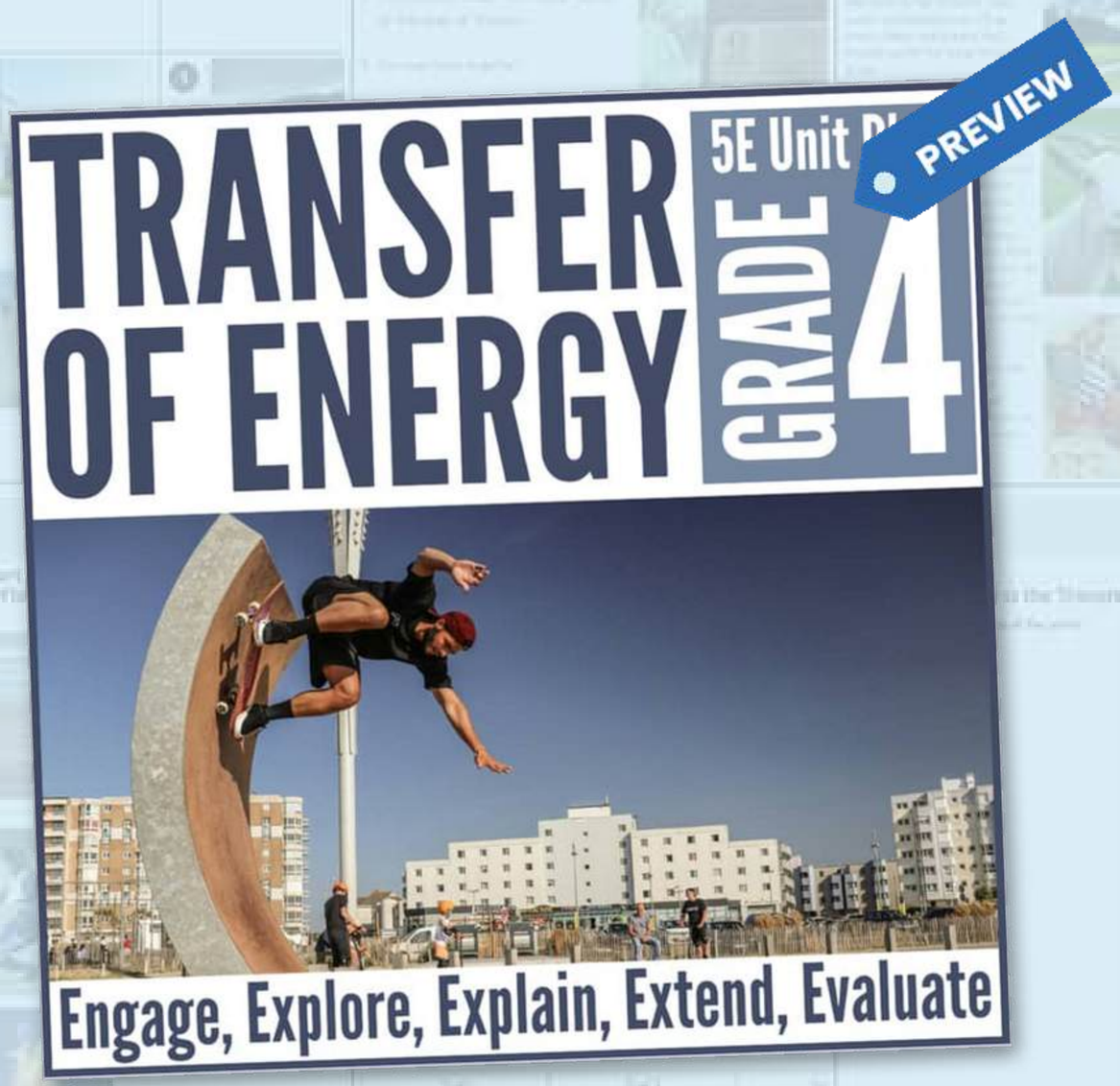


A Complete 5E Science Unit with Lesson Plans

4TH GRADE

TRANSFER OF ENERGY

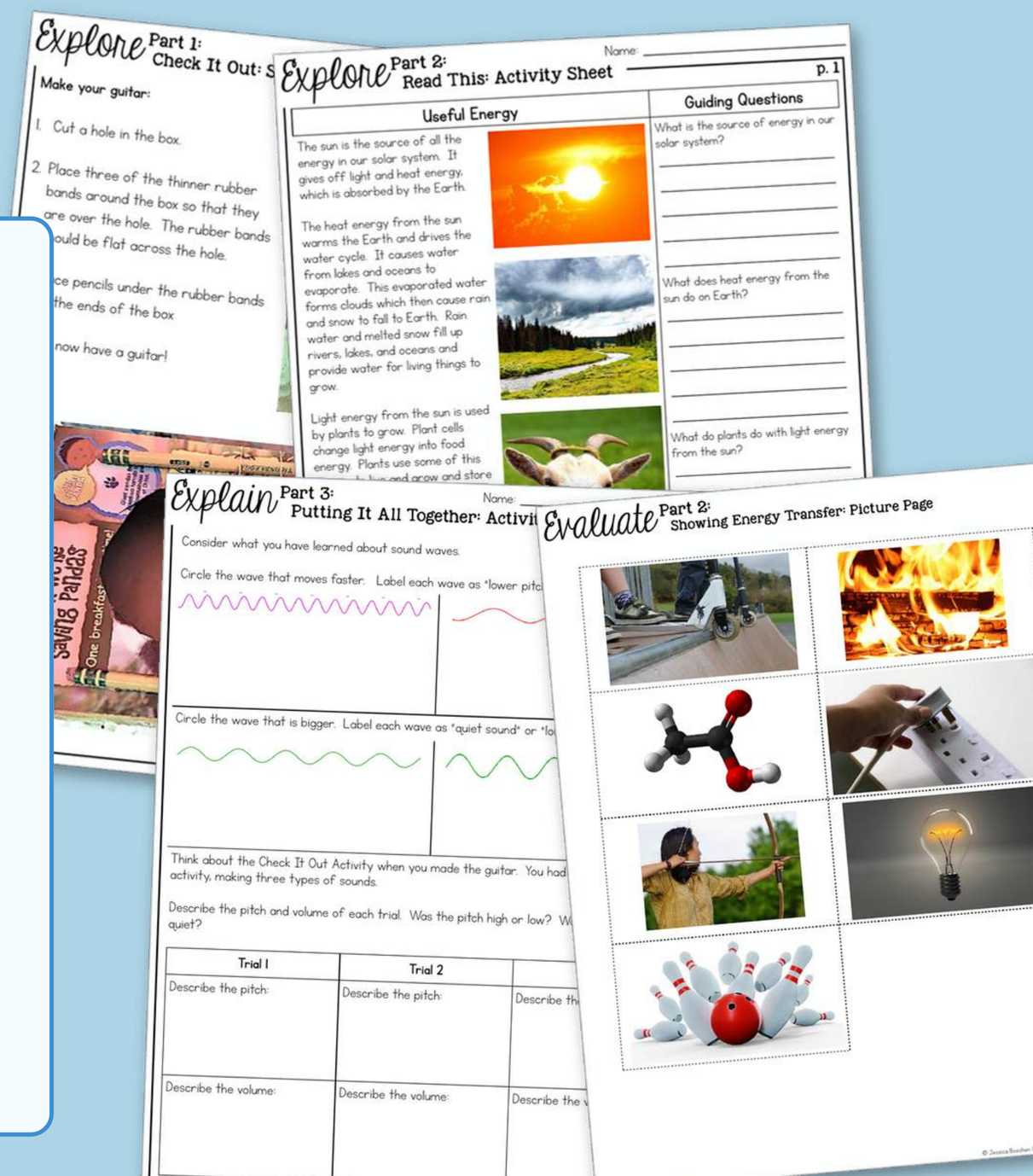
Engage, Explore, Explain, Extend, Evaluate
NGSS 4-PS3-2

KEEP SCROLLING TO SEE WHAT'S INSIDE!

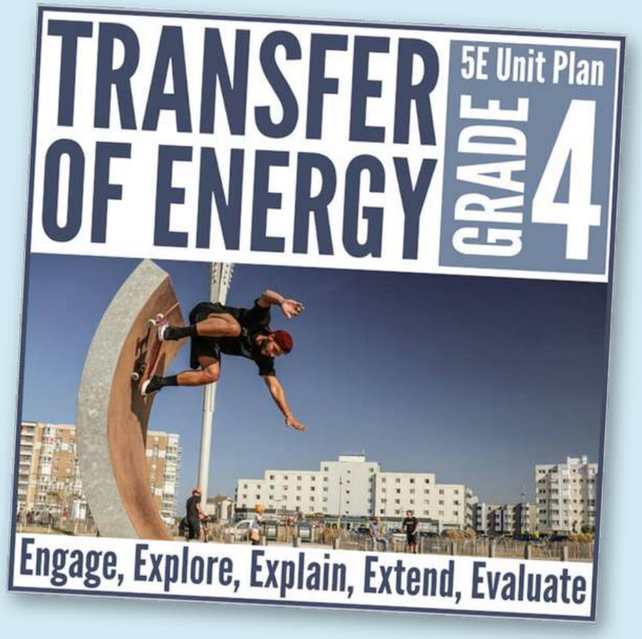
WHAT'S INCLUDED

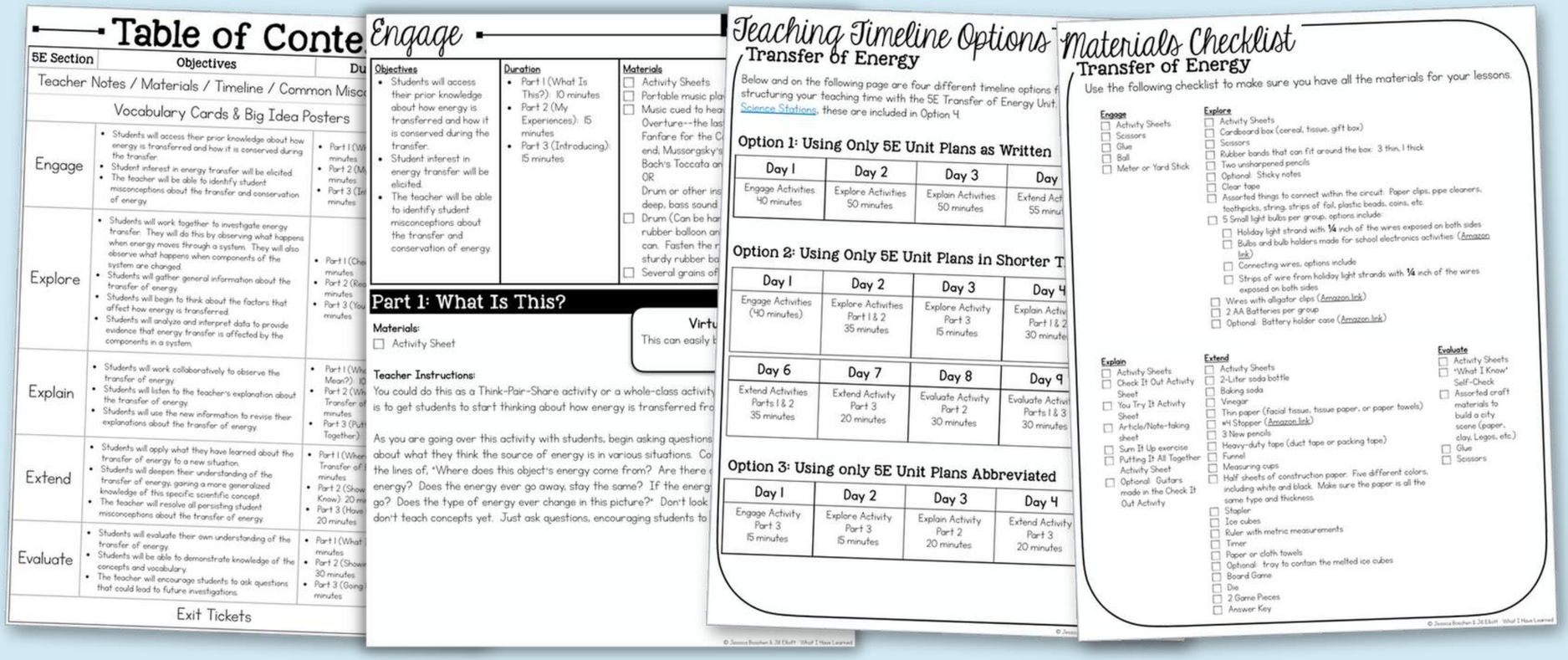
5E TRANSFER OF ENERGY UNIT

- 220+ Page 5E Unit Plan
- Lesson Plans for All 5 Phases
- Teacher Notes and Misconceptions
- Materials Checklist and 4 Timelines
- Hands-On Energy Investigations
- Reading Passages on Energy Transfer
- Vocabulary Cards and Big Idea Posters
- Exit Tickets in 3 Formats
- Performance Assessment
- Answer Keys for Student Pages
- Google Slides and Google Forms Versions



UNIT AT A GLANCE





- Students make a box guitar, light a bulb with circuits, and launch a bottle rocket.
- Teacher background, lesson plans, and student pages in every phase.
- Aligned to NGSS 4-PS3-2.

Table of Contents **Teacher Notes** **Timeline Options** **Materials Checklist**

ENGAGE



Teacher background, lesson plans, student pages, and answer key

E E E E E

Spark curiosity with bass and a drum

1 What Is This?

Students look at pictures like lightning and a guitar and guess where the energy comes from.

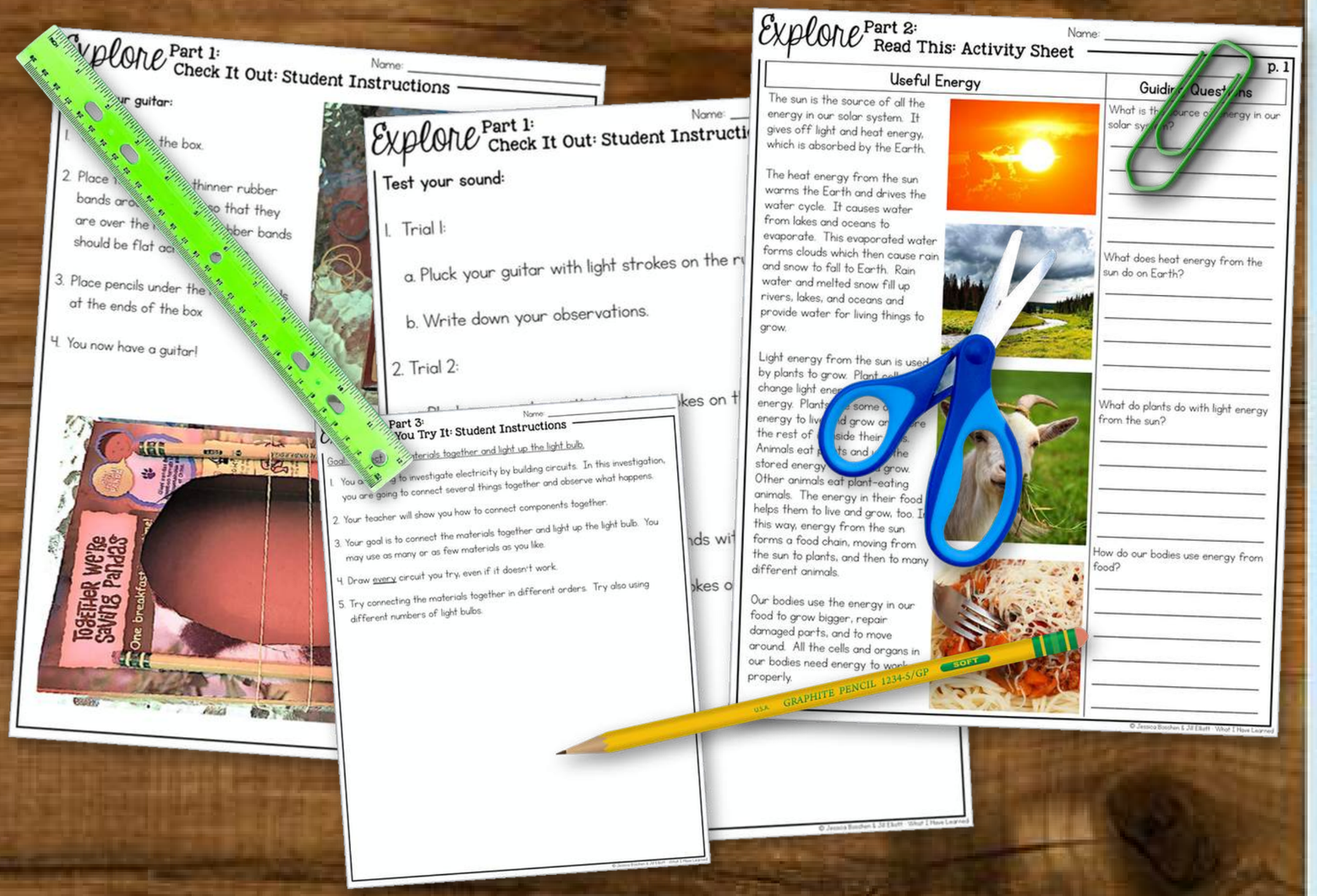
2 My Experiences

Students write what they know about energy and where Earth's energy comes from.

3 Introducing Transfer of Energy

Students play bass music at different volumes next to a drum and watch the rice move.

EXPLORE



Teacher background, lesson plans, student pages, and answer key

E E E E E

Investigate how energy moves

1 Check It Out

Students make a box guitar and test how plucking and thicker bands change the sound.

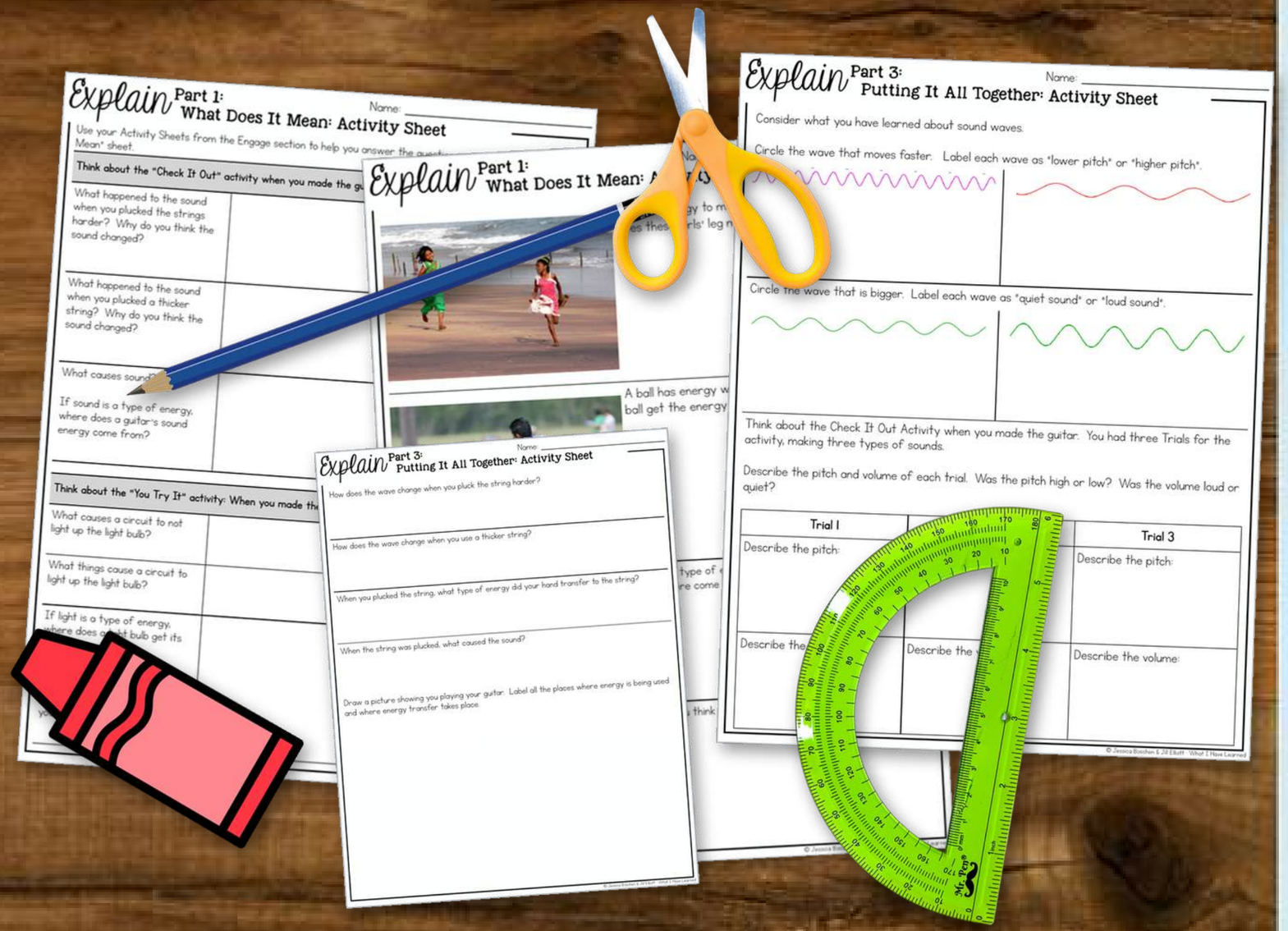
2 Read This

Students read about the sun, plants, and food as useful energy.

3 You Try It

Students build circuits to light a bulb and draw every one they try.

EXPLAIN



Teacher background, lesson plans, student pages, and answer key

E E E E E

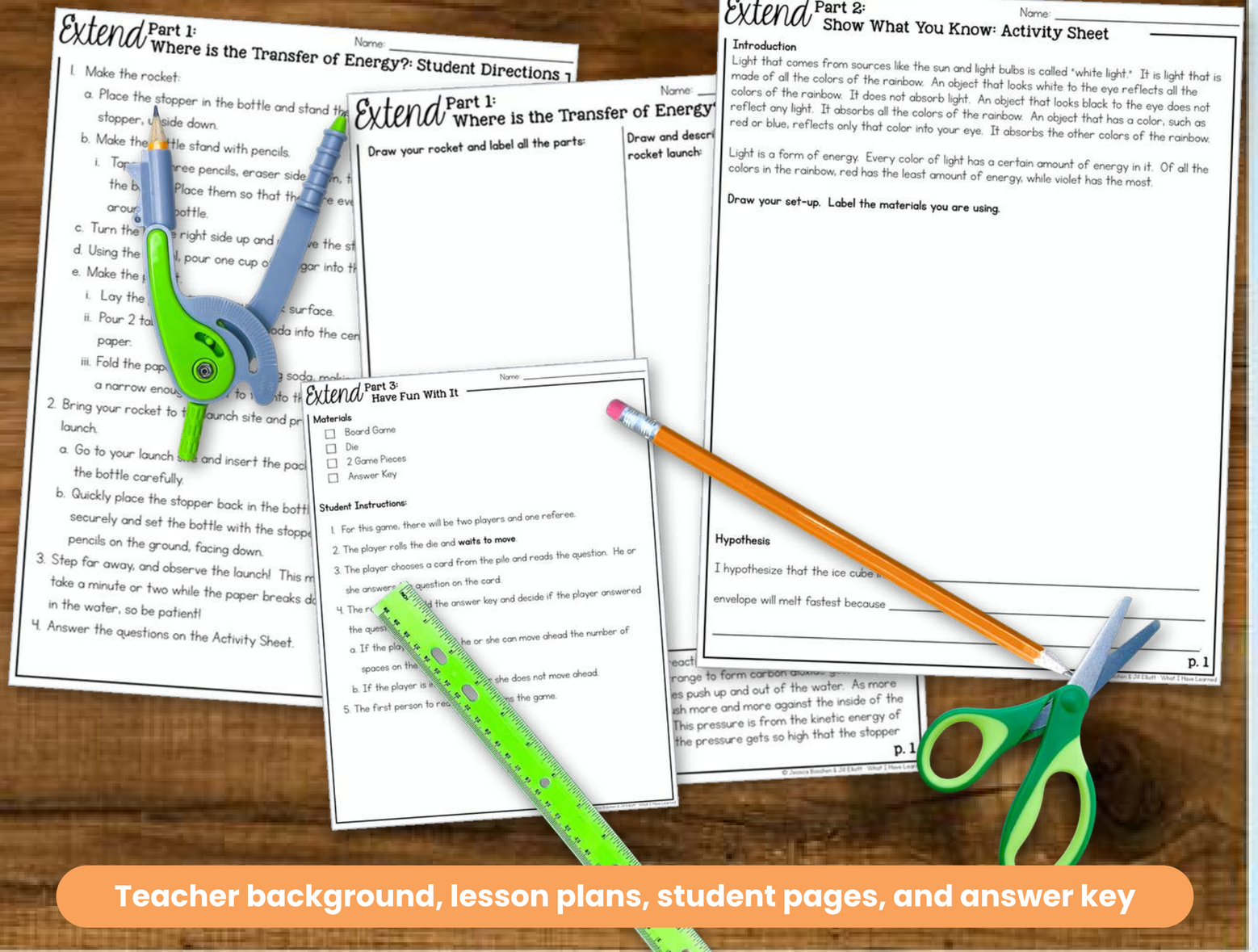
Build explanations from evidence

1 What Does It Mean?
Students use their guitar and circuit results to explain what causes sound and light.

2 What Is the Transfer of Energy?
Students read about sound, light, and heat energy and sum up what they learned.

3 Putting It All Together
Students compare sound waves and show where energy is transferred in a picture.

EXTEND



Teacher background, lesson plans, student pages, and answer key

E E E E E

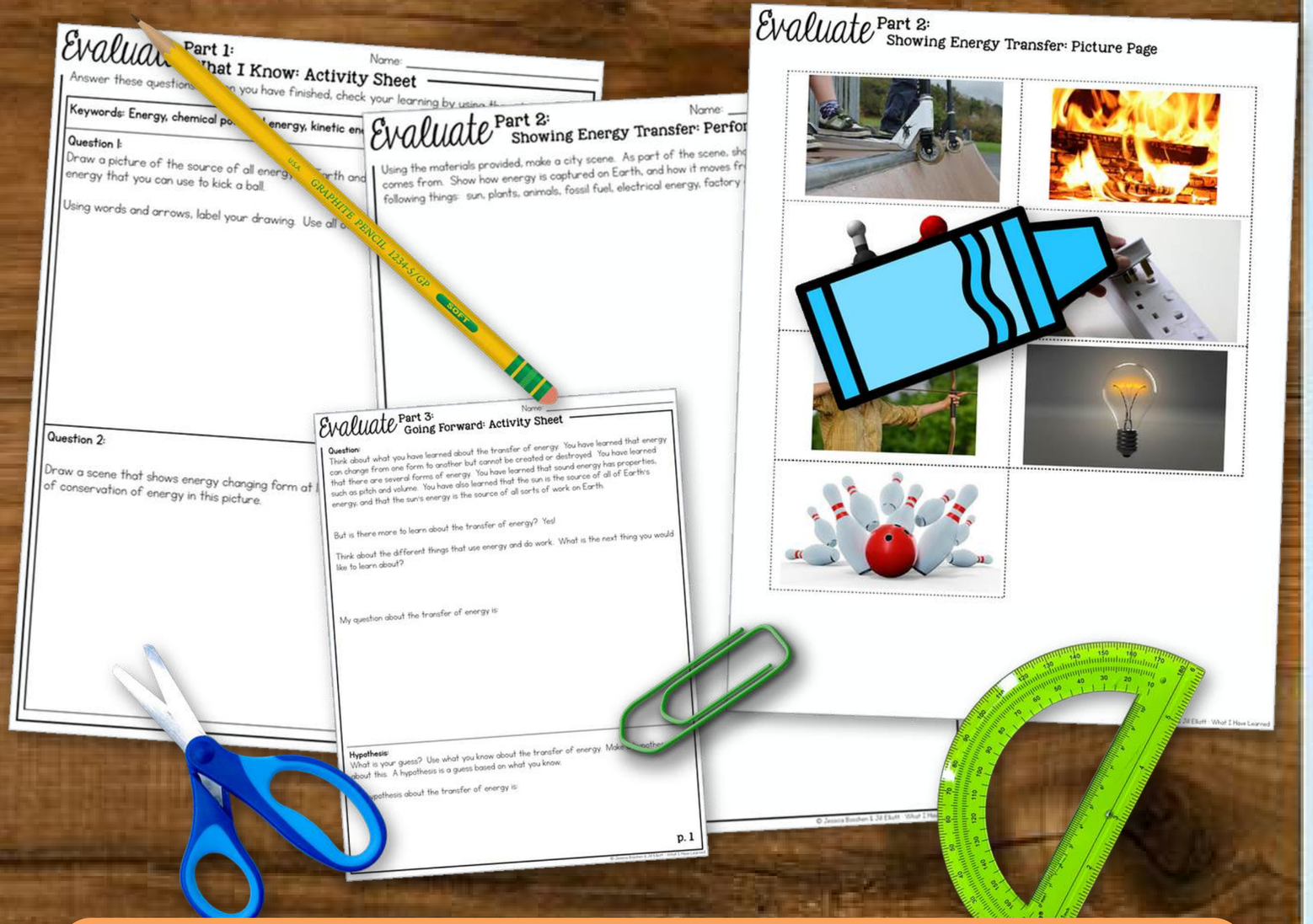
Apply energy transfer to new situations

1. **Where Is the Transfer of Energy?**
   Students launch a baking soda and vinegar rocket and explain where the energy goes.

2. **Show What You Know**
   Students test which envelope color melts an ice cube fastest.

3. **Have Fun With It**
   Students play a board game by answering energy questions.

EVALUATE



Teacher background, lesson plans, student pages, and answer key

E E E E E

Check understanding with evidence

1 What I Know

Students draw where Earth's energy comes from and score themselves with a rubric.

2 Showing Energy Transfer

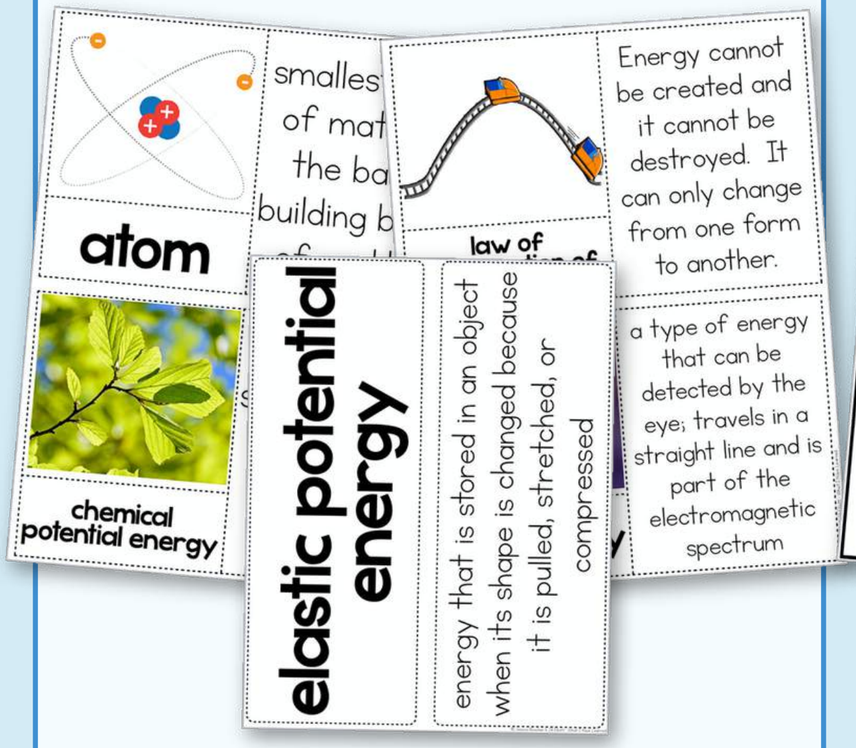
Students build a city scene that shows energy being transferred.

3 Going Forward

Students write a new question and hypothesis about energy transfer.

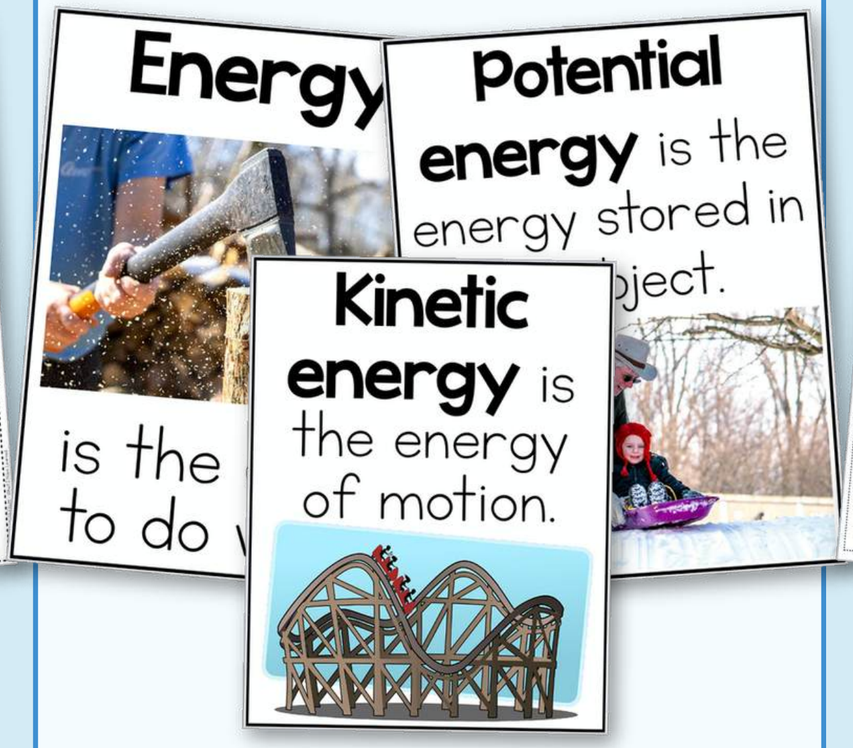
VOCABULARY, POSTERS & EXIT TICKETS

VOCABULARY CARDS



Picture cards and word cards for atom, light energy, elastic potential energy, and more.

BIG IDEA POSTERS



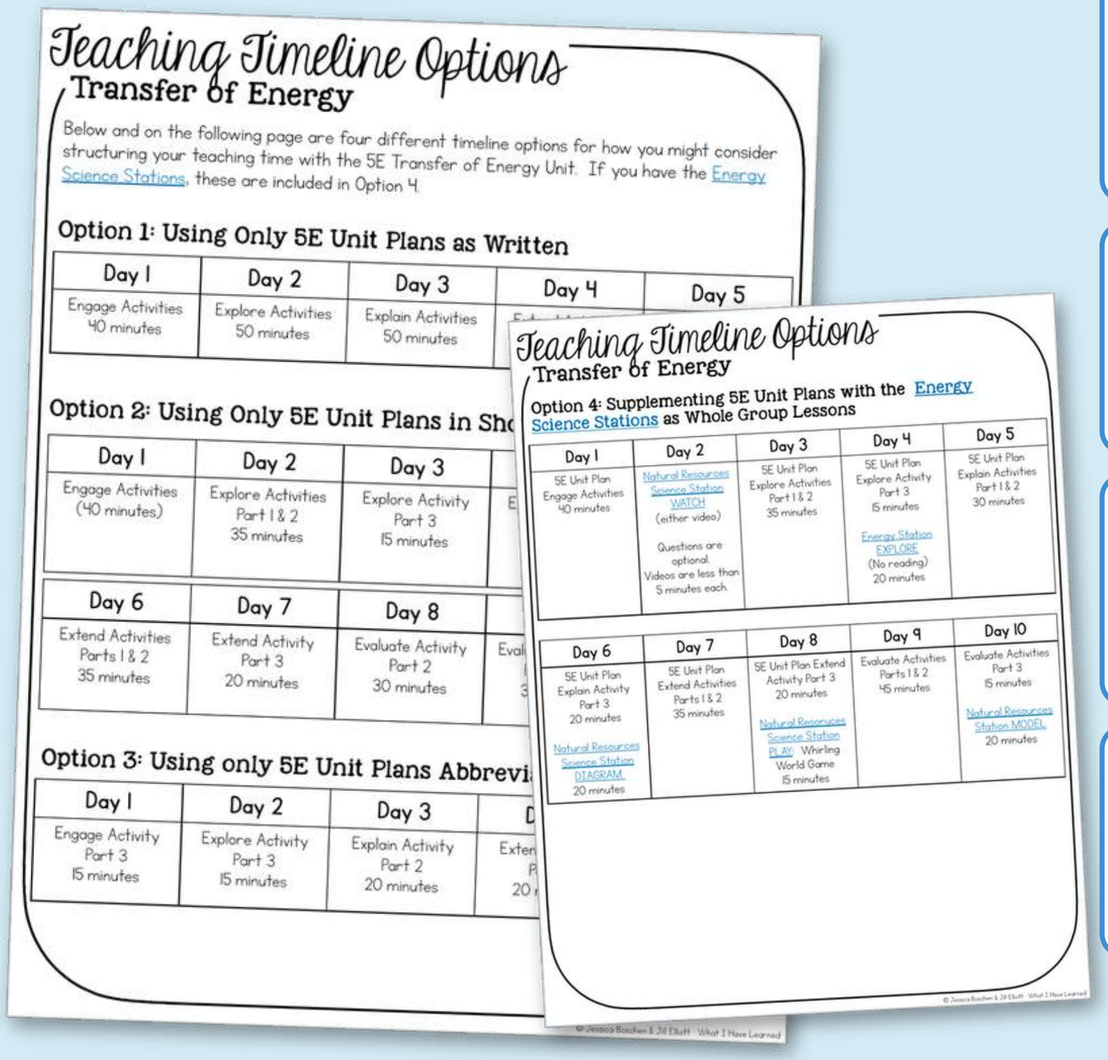
Six posters on energy, forms of energy, potential energy, and kinetic energy.

EXIT TICKETS



10 exit tickets, each in short answer, fill-in-the-blank, and multiple choice formats.

WAYS TO USE IN YOUR CLASSROOM



Teaching Timeline Options
Transfer of Energy

Below and on the following page are four different timeline options for how you might consider structuring your teaching time with the 5E Transfer of Energy Unit. If you have the Energy Science Stations, these are included in Option 4.

Option 1: Using Only 5E Unit Plans as Written

Day 1	Day 2	Day 3	Day 4	Day 5
Engage Activities 40 minutes	Explore Activities 50 minutes	Explain Activities 50 minutes		

Option 2: Using Only 5E Unit Plans in Sho

Day 1	Day 2	Day 3	
Engage Activities (40 minutes)	Explore Activities Part 1 & 2 35 minutes	Explore Activity Part 3 15 minutes	E
Day 6	Day 7	Day 8	
Extend Activities Parts 1 & 2 35 minutes	Extend Activity Part 3 20 minutes	Evaluate Activity Part 2 30 minutes	Eval

Option 3: Using only 5E Unit Plans Abbrevi

Day 1	Day 2	Day 3	
Engage Activity Part 3 15 minutes	Explore Activity Part 3 15 minutes	Explain Activity Part 2 20 minutes	Exten P 20

Teaching Timeline Options
Transfer of Energy

Option 4: Supplementing 5E Unit Plans with the Energy Science Stations as Whole Group Lessons

Day 1	Day 2	Day 3	Day 4	Day 5
5E Unit Plan Engage Activities 40 minutes	Natural Resources Science Station WATCH (either video) Questions are optional. Videos are less than 5 minutes each.	5E Unit Plan Explore Activities Part 1 & 2 35 minutes	5E Unit Plan Explore Activity Part 3 15 minutes Energy Station EXPLORE (No reading) 20 minutes	5E Unit Plan Explain Activities Part 1 & 2 30 minutes
Day 6	Day 7	Day 8	Day 9	Day 10
5E Unit Plan Explain Activity Part 3 20 minutes Natural Resources Science Station DIAGRAM 20 minutes	5E Unit Plan Extend Activities Parts 1 & 2 35 minutes	5E Unit Plan Extend Activity Part 3 20 minutes Natural Resources Science Station PLAY: Whirling World Game 15 minutes	Evaluate Activities Parts 1 & 2 45 minutes	Evaluate Activities Part 3 15 minutes Natural Resources Station MODEL 20 minutes

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1

Whole-Class 5E Unit

Teach one phase a day over 5 days as written, with 40 to 55 minutes per phase.

2

Shorter Science Blocks

Spread the unit across 9 days in shorter time blocks when science minutes are limited.

3

Alongside Science Stations

Add the Energy Science Stations for a 10-day plan.

4

Formative Checks

Use the exit tickets throughout the unit to see who needs reteaching before the performance activity.

TEACHING TIMELINE OPTIONS

Option 1 — 5 days
As Written

Day 1	Day 2	Day 3	Day 4	Day 5
Engage	**Explore**	**Explain**	**Extend**	**Evaluate**
40 min	50 min	50 min	55 min	55 min

Option 2 — 9 days
Shorter Time Blocks

Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9
Engage	**Explore 1-2**	**Explore 3**	**Explain 1-2**	**Explain 3**	**Extend 1-2**	**Extend 3**	**Evaluate 2**	**Evaluate 1 & 3**
40 min	35 min	15 min	30 min	20 min	35 min	20 min	30 min	30 min

Option 3 — 5 days
Abbreviated

Day 1	Day 2	Day 3	Day 4	Day 5
Engage 3	**Explore 3**	**Explain 2**	**Extend 3**	**Evaluate 1**
15 min	15 min	20 min	20 min	15 min

Option 4 — 10 days
With Science Stations

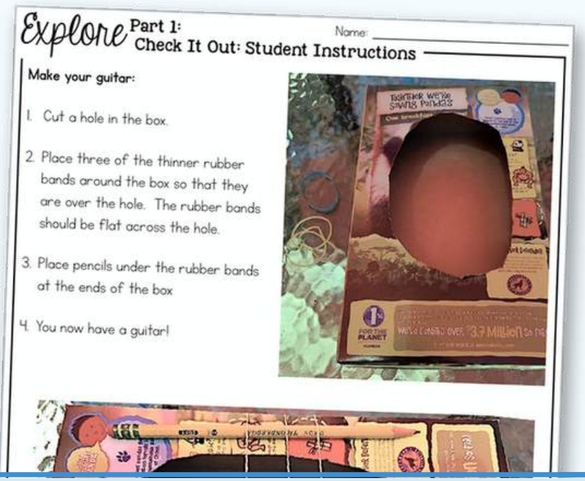
Day 1	Day 2	Day 3	Day 4	Day 5	Day 6	Day 7	Day 8	Day 9	Day 10
Engage	**Watch**	**Explore 1-2**	**Explore 3**	**Explain 1-2**	**Explain 3**	**Extend 1-2**	**Extend 3**	**Evaluate 1-2**	**Evaluate 3**
40 min	5 min	35 min	15 min +20 station	30 min	20 min +20 station	35 min	20 min +15 station	45 min	15 min +20 station

Orange days are Science Station lessons. Magenta notes are extra station activities you can add that day.

YOU WILL LOVE THIS BECAUSE

Hands-On From Day One

Students make a box guitar, build circuits, and launch a rocket, so energy transfer makes sense.


Explore Part 1: Check It Out: Student Instructions

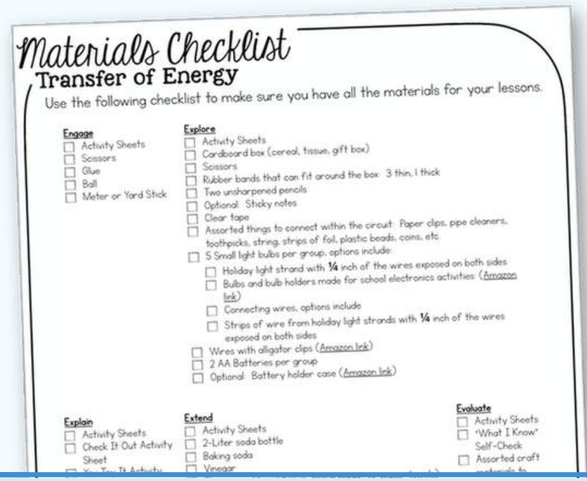
Name: _____

Make your guitar:

1. Cut a hole in the box.
2. Place three of the thinner rubber bands around the box so that they are over the hole. The rubber bands should be flat across the hole.
3. Place pencils under the rubber bands at the ends of the box
4. You now have a guitar!

Planned and Ready to Teach

Teacher notes, a misconceptions guide, a materials checklist, and answer keys are done for you.


Materials Checklist

Transfer of Energy

Use the following checklist to make sure you have all the materials for your lessons.

Engage
- ☐ Activity Sheets
- ☐ Scissors
- ☐ Glue
- ☐ Ball
- ☐ Meter or Yard Stick

Explore
- ☐ Activity Sheets
- ☐ Cardboard box (cereal, tissue, gift box)
- ☐ Scissors
- ☐ Rubber bands that can fit around the box: 3 thin, 1 thick
- ☐ Two unsharpened pencils
- ☐ Optional: Sticky notes
- ☐ Clear tape
- ☐ Assorted things to connect within the circuit: Paper clips, pipe cleaners, toothpicks, string, strips of foil, plastic beads, coins, etc.
- ☐ 5 Small light bulbs per group, options include:
  - ☐ Holiday light strand with ¼ inch of the wires exposed on both sides
  - ☐ Bulbs and bulb holders made for school electronics activities (Amazon link)
  - ☐ Connecting wires, options include
  - ☐ Strips of wire from holiday light strands with ¼ inch of the wires exposed on both sides
- ☐ Wires with alligator clips (Amazon link)
- ☐ 2 AA Batteries per group
- ☐ Optional: Battery holder case (Amazon link)

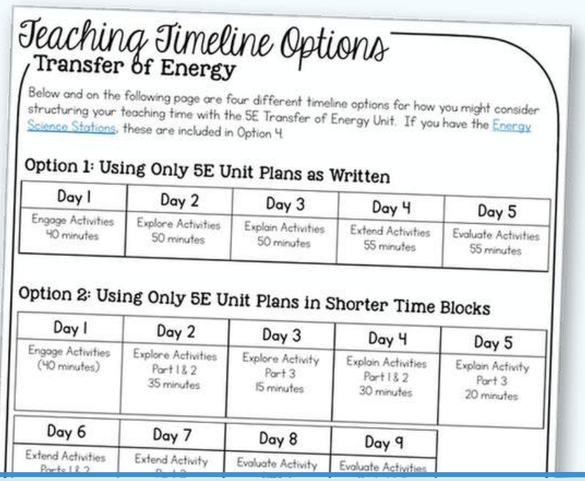
Explain
- ☐ Activity Sheets
- ☐ Check It Out Activity Sheet

Extend
- ☐ Activity Sheets
- ☐ 2-Liter soda bottle
- ☐ Baking soda
- ☐ Vinegar

Evaluate
- ☐ Activity Sheets
- ☐ "What I Know" Self-Check
- ☐ Assorted craft

Fits Your Schedule

Choose from 4 timeline options, and use the Google Slides and Google Forms versions for a print or digital classroom.


Teaching Timeline Options

Transfer of Energy

Below and on the following page are four different timeline options for how you might consider structuring your teaching time with the 5E Transfer of Energy Unit. If you have the Energy Science Stations, these are included in Option 4.

Option 1: Using Only 5E Unit Plans as Written

Day 1	Day 2	Day 3	Day 4	Day 5
Engage Activities 40 minutes	Explore Activities 50 minutes	Explain Activities 50 minutes	Extend Activities 55 minutes	Evaluate Activities 55 minutes

Option 2: Using Only 5E Unit Plans in Shorter Time Blocks

Day 1	Day 2	Day 3	Day 4	Day 5
Engage Activities (40 minutes)	Explore Activities Part 1 & 2 35 minutes	Explore Activity Part 3 15 minutes	Explain Activities Part 1 & 2 30 minutes	Explain Activity Part 3 20 minutes

Day 6	Day 7	Day 8	Day 9
Extend Activities Parts 1 & 2	Extend Activity	Evaluate Activity	Evaluate Activities

TEACHERS LOVE IT!

★★★★★

Very helpful in getting the students to understand the transfer of energy.

Sheryl S.

★★★★★

This was a great resource to use when teaching about energy.

Officially Ohio

★★★★★

I loved this resource. It was so helpful since I plan science for my team.

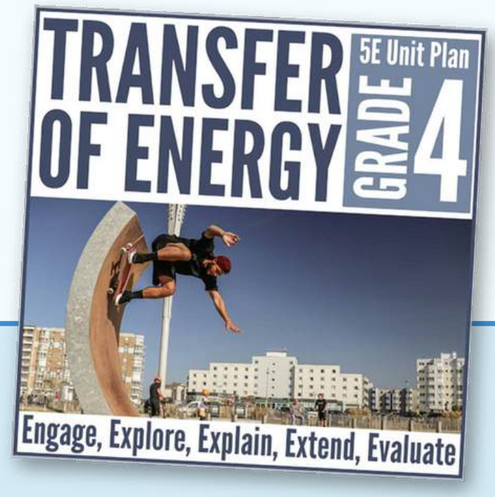
Casi E.





READY FOR YOUR CLASSROOM

- **Instant digital download**
- **Print and use the activities**
- **Google Slides and Forms versions**



WANT MORE 4TH GRADE 5E UNITS?

Save with a topic bundle or the full-year bundle.

TOPIC BUNDLE

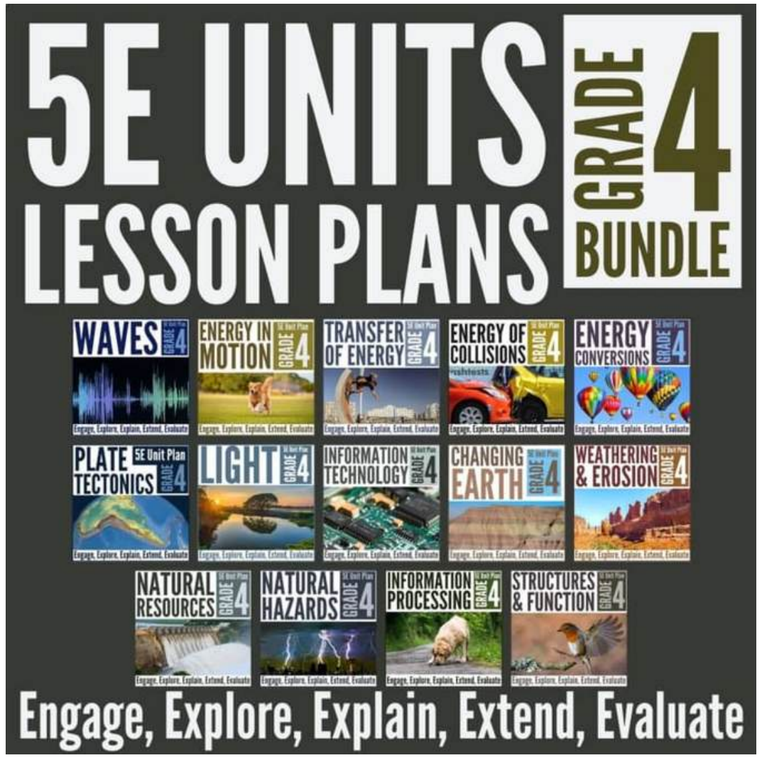
GOOD VALUE



SEE THE BUNDLE

FULL-YEAR BUNDLE

BEST VALUE



SEE THE BUNDLE

My passion is making learning accessible to all students.

I love scaffolding learning, breaking down the concepts and building them up so that students can see the connections. I love figuring out the small components that build up to the big ideas and helping students see it all.





What I have LEARNED