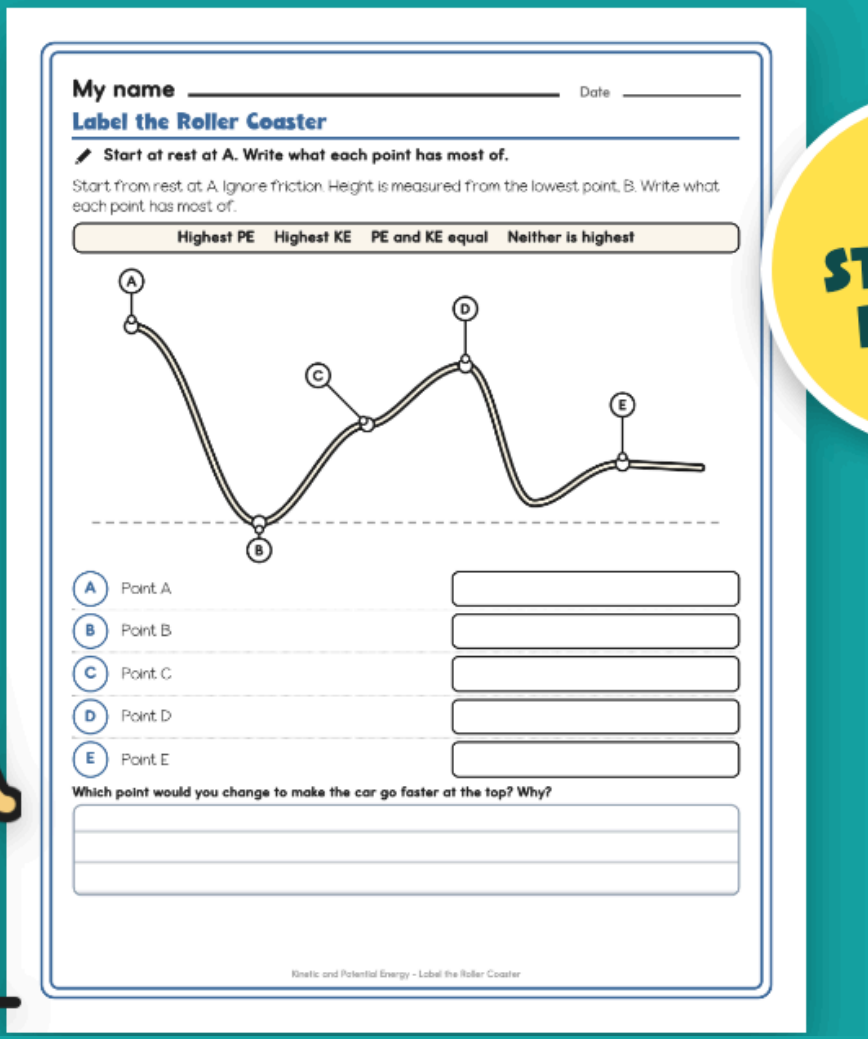
KINETIC AND POTENTIAL ENERGY

WORKSHEETS - GRADES 6-8


My name _____ Date _____

Label the Roller Coaster

Start at rest at A. Write what each point has most of.

Start from rest at A. Ignore friction. Height is measured from the lowest point, B. Write what each point has most of.

Highest PE	Highest KE	PE and KE equal	Neither is highest

A	Point A	
B	Point B	
C	Point C	
D	Point D	
E	Point E	

Which point would you change to make the car go faster at the top? Why?

Kinetic and Potential Energy - Label the Roller Coaster

23 STUDENT PAGES



Bright Path Sped

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This is a fillable PDF

- Open it in a PDF reader (Adobe Acrobat Reader, Preview, or your browser), click into a line or a box, type, and Save As.
- The name line, every answer box, every ruled work box and every check box on the student pages are type-in fields, and so are the tracker, class grid, team note and family page. You can also print any page and write by hand.
- It works offline. No account, no subscription, no internet connection needed after you download it.

Print at 100 percent

Turn off fit to page and shrink to fit so the ruled lines stay 0.34 inch apart. Every student page is black and white inside a colored border, so it still reads when copied in black and white.

Student work

A filled-in tracker, class grid or team note carries a real student's name. Keep it in the data folder, and use a first name only on any page that leaves your hands.

Need help?

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PREVIEW

How To Read a Page

The parts of a student page, then the kinds of sheet in the order they come.

The parts of a page

- **The answer box.** A bordered box for a letter, a number or a word. Click it to type, or print and write in it.
- **The ruled work box.** Lines 0.34 inch apart for sentences. Write one idea to a line.
- **The check box.** True or false, yes or not yet: click or mark.
- **The word bank.** A box of words to use. Some words are used once, some twice, some not at all.
- **The cut line.** Twelve pieces in a 4 by 3 grid, edge to edge: two straight cuts across and three down.

Kind of sheet	How many	What the student does
Readings and cards	4 sheets	Read, answer, and keep the energy cards to look things up.
Words and matching	3 sheets, 14 items	Match words and clues; try a worked example.
Labeling and the chart	3 sheets, 21 items	Label the coaster and the pendulum, then fill in what changes.
True or false and mistakes	3 sheets, 16 items	Check sentences, fix false ones, find Mara's mistakes.
Writing	4 sheets, 12 questions	Short answers, then explain-it boxes with five ruled lines each.
Quizzes, exit tickets, sorts	12 items, 3 tickets, 24 pieces	Two quizzes, one exit sheet, two cut-and-paste mats.

Untimed, unscored on the page

No student page has a timer or a score on it. The keys and the tracker are for you. The answer keys are on pages 28 to 32.

Short answers and explain-its

Their keys (page 31) say what to look for, not one right sentence. Accept any answer that uses a fact from the readings or the cards.

Printing and the type-in fields

Every page prints clean in black and white. The name line, every answer box, every ruled box and every check box are type-in fields in any PDF reader: click one, type, then save. This is a fillable PDF, not a slideshow or a word-processor file.

Room to work

Work boxes hold three or more lines. If a student needs more room, hand over one page a day, or let students write on scrap paper and copy their best sentences into the box.

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

Reading 1: Moving and Stored Energy

Read about energy. Then answer.

Kinetic energy and potential energy

Energy is the ability to make things happen. Two of the main kinds of energy in motion and position are **kinetic energy** and **potential energy**. Kinetic energy is the energy an object has because it is moving. A faster object has more kinetic energy than a slower object of the same mass. Potential energy is **stored** energy. An object has it because of its position or its shape. A book on a high shelf has **gravitational potential energy**, because of its height. A stretched rubber band has **elastic potential energy**, because of its shape.

Main idea: What is this reading mostly about?

Check what you read. Write the letter in the box.

1. What is kinetic energy?
   - **A** Energy an object has because it is moving
   - **B** Stored energy from its height
   - **C** Energy from a battery only

2. A faster object has what, compared with a slower object of the same mass?
   - **A** Less kinetic energy
   - **B** More kinetic energy
   - **C** No kinetic energy

3. Which object has stored energy because of its shape?
   - **A** A moving bicycle
   - **B** A ball rolling on the floor
   - **C** A stretched rubber band

PREVIEW

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My name _____ Date _____

Energy Cards 1

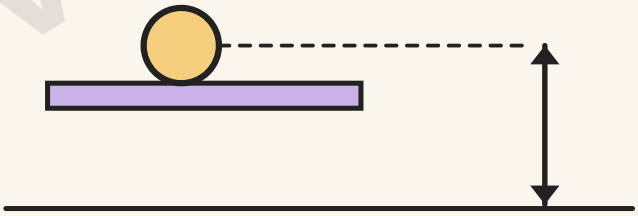
Read the cards. Use them all week.

Kinetic Energy



What it is	Energy an object has because it is moving
Depends on	its mass and its speed
More when	the object moves faster, or is heavier at the same speed
Zero when	the object is not moving
Examples	a rolling ball, a running child, a sled on a hill

Gravitational Potential Energy



What it is	Stored energy from an object's height above the ground
Depends on	its mass and its height
More when	the object is higher, or heavier at the same height
When it falls	its height goes down, so this energy goes down
Examples	a book on a shelf, a kite in the sky, water in a water tower

Pick one card. Tell what it does in your own words.

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

Energy Words

Match each word to what it means.

Write the letter of the meaning in the box. Use the readings to help you.

1	**kinetic energy**		**A**	Kinetic energy plus potential energy in one object.
2	**potential energy**		**B**	Stored energy from an object's height above the ground.
3	**gravitational potential energy**		**C**	A force that rubs against motion and slows it down.
4	**elastic potential energy**		**D**	Energy an object has because it is moving.
5	**mechanical energy**		**E**	Stored energy in something stretched or squeezed.
6	**friction**		**F**	Stored energy from an object's position or shape.

Use two of the words in one sentence about a moving or a stored thing.

PREVIEW

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My name _____ Date _____

Who Am I?

Who am I? Write the kind of energy.

Each kind of energy is used two times. Write the kind that fits.

Kinetic energy	Gravitational potential energy	Elastic potential energy
Mechanical energy		

1. I am the energy a sled has as it slides down the hill. _____
2. I am stored energy because of how high an object is. _____
3. I am stored in a spring that is squeezed. _____
4. I am the kinetic and potential energy of one object added together. _____
5. I am the energy a book has on a high shelf. _____
6. I depend on mass and speed, and I am zero when nothing moves. _____
7. I stay the same on a roller coaster when friction is ignored. _____
8. I am the energy in a rubber band that is stretched. _____

Pick one clue. Tell the word that helped you.

PREVIEW

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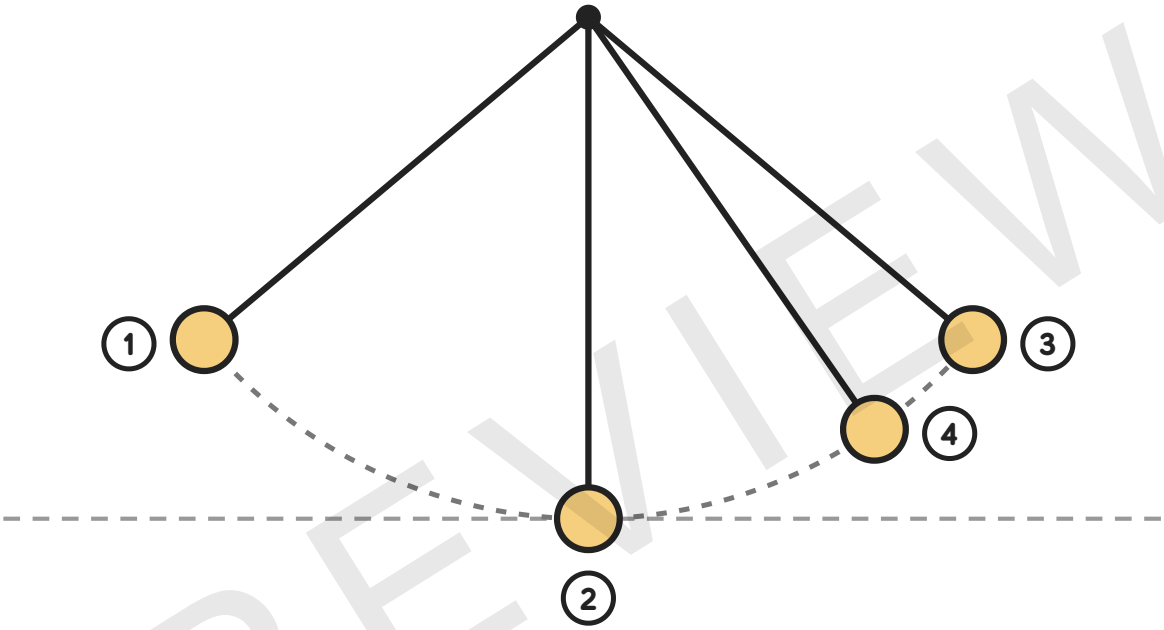
My name _____ Date _____

Label the Pendulum

Write what each number point has most of.

The bob starts at rest at position 1. Ignore friction and air. Write what each number point has most of.

Highest PE	Highest KE	PE and KE equal	Neither is highest



PREVIEW

1 Point 1 _____

2 Point 2 _____

3 Point 3 _____

4 Point 4 _____

At which number is the bob moving fastest? Tell how you know.

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My name _____ Date _____

True or False 1

Is it true or false? Check one.

Check true or false for each sentence.

1. Kinetic energy is the energy an object has because it is moving. ☐ true ☐ false

2. A rock on a cliff has kinetic energy. ☐ true ☐ false

3. A faster object has more kinetic energy than a slower object of the same mass. ☐ true ☐ false

4. Stored energy is called potential energy. ☐ true ☐ false

5. A stretched rubber band has elastic potential energy. ☐ true ☐ false

6. Friction makes a moving object speed up. ☐ true ☐ false

Pick one false sentence. Fix it so it is true.

PREVIEW

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My name _____ Date _____

Short Answers 1

Answer each question in sentences.

Use facts from the readings and the cards. Write in sentences.

1. What is the difference between kinetic energy and potential energy? Give one example of each.

2. As a roller coaster goes down a hill, what happens to its potential energy? What happens to its kinetic energy?

3. With friction ignored, why does a pendulum swing back up to the same height?

PREVIEW

My name _____ Date _____

Explain It 1

Explain your thinking in sentences.

Use what you know about kinetic and potential energy. Say why.

Start with: I know that ____ because ____.

1. A bowling ball and a tennis ball roll down the same lane at the same speed. Which one has more kinetic energy? Why?

2. Why is a rubber band able to make something move when you let go, but a loose rubber band is not?

3. A roller coaster starts at rest at the top of a hill. Explain why it cannot climb back higher than where it started, if friction is ignored.

PREVIEW

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My name _____ Date _____

Find the Mistake

Find the mistake. Then fix it.

Mara is made up for practice. Each sentence has one mistake.

1 **Mara wrote:**

"A book on a high shelf has kinetic energy."

What is wrong?

Write it the right way.

2 **Mara wrote:**

"A faster car has less kinetic energy."

What is wrong?

Write it the right way.

3 **Mara wrote:**

"At the top of a hill, a roller coaster has the most kinetic energy."

What is wrong?

Write it the right way.

4 **Mara wrote:**

"A stretched rubber band has gravitational potential energy."

What is wrong?

Write it the right way.

PREVIEW

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My name _____ Date _____

Quiz B

Pick the best answer. Write its letter.

Take your time. Guess if you are not sure.

7 A ball is at rest at the top of a hill. Which is true?

A It has potential energy and no kinetic energy
B It has kinetic energy and no potential energy
C It has no energy at all

8 What does friction do to a box sliding across the floor?

A Speeds it up
B Slows it down and warms the surfaces
C Stores it as elastic energy

9 Which object has the most gravitational potential energy?

A A light ball on the ground
B A heavy ball on the ground
C A heavy ball held high above the ground

10 Mechanical energy is the total of which two kinds?

A Kinetic and potential energy
B Light and sound energy
C Heat and light energy

11 What kind of energy does a compressed spring store?

A Elastic potential energy
B Kinetic energy
C Gravitational potential energy

12 A pendulum swings from its highest point toward the bottom. What happens to its potential energy?

A It goes up
B It goes down
C It stays the same

PREVIEW

Preview · Bright Path Sped

My name _____ Date _____

Check My Own Work

Check your own work. Mark yes or not yet.

1	I can say what kinetic energy is.	☐ yes	☐ not yet
2	I can say what potential energy is.	☐ yes	☐ not yet
3	I can tell kinetic energy from potential energy in an example.	☐ yes	☐ not yet
4	I know what gravitational potential energy depends on.	☐ yes	☐ not yet
5	I can say where a roller coaster has the most potential energy.	☐ yes	☐ not yet
6	I can say where a pendulum has the most kinetic energy.	☐ yes	☐ not yet
7	I can say what changes as an object falls.	☐ yes	☐ not yet
8	I can explain why friction is ignored in some problems.	☐ yes	☐ not yet

The kind of energy I can explain best is...

The part I still need help with is...

PREVIEW

My name _____ Date _____

Cut and Paste 2: Three Kinds

Cut out the twelve pieces. Paste each one in the right box.

Read each piece. Which kind of energy does it have most of? Put it in the right box.

Kinetic energy	Gravitational potential energy	Elastic potential energy

Cut on the dashed lines: twelve pieces, two cuts across and three cuts down.

An apple hanging high in a tree	A stretched bungee cord	A kid on a swing moving fast	A flowerpot on a high windowsill
A wound-up toy with its spring tight	A boat moving across a lake	A rock at the top of a cliff	A squeezed stress ball
A train moving down the track	A kite high in the sky	A pulled-back slingshot	A bus driving on the highway

Which piece surprised you? Why?

PREVIEW

Answer Key: Worked Example, Labels, Chart

Coaster and pendulum answers come from the heights drawn on the page: the lowest point has the most kinetic energy, the highest point the most potential energy, and a point halfway up has the two equal.

Worked Example: your turn page 10

Step	Answer
Step 1 key words	high shelf / does not move
Step 2 kind of energy	Gravitational potential energy
Check	No: it is not moving, so it is not kinetic energy. It has stored energy from its height.

Label the Roller Coaster page 12

Point	Where it is	Answer
A	top of the first hill, where it starts	Highest PE
B	lowest point, the bottom of the first dip	Highest KE
C	halfway up the rise to the second hill	PE and KE equal
D	top of the second hill	Neither is highest
E	top of the small last hill	Neither is highest

Label the Pendulum page 13

No.	Where it is	Answer
1	left end of the swing	Highest PE
2	bottom of the swing	Highest KE
3	right end of the swing	Highest PE
4	halfway up the right side	PE and KE equal

Fill In the Chart page 14

What happens	Height	Potential energy	Speed	Kinetic energy
A ball falls off a shelf	goes down	decreases	increases	increases
A ball is thrown straight up	goes up	increases	decreases	decreases
A roller coaster goes down a hill	goes down	decreases	increases	increases

Shade the bars (page 14): at D the PE bar is 8 squares and the KE bar is 2 squares, 10 in all.

PREVIEW

Answer Key: Writing

These pages have no single right sentence. Accept any answer that uses a fact from the readings or the cards.

Short answers: what to look for pages 17, 18

Item	Look for
17.1	Kinetic energy is the energy of motion; potential energy is stored energy. Examples: a moving skateboard (kinetic) and a book on a shelf (potential).
17.2	Its potential energy goes down as its height goes down, and its kinetic energy goes up as it speeds up (friction ignored).
17.3	The total mechanical energy stays the same, so at the end of the swing it has the same stored energy it started with.
18.1	It depends on the object's mass and its height above the ground.
18.2	Its kinetic energy goes down as it slows, and its potential energy goes up as its height goes up. At the top, its kinetic energy is zero.
18.3	Friction slows the object down, and it turns some of the moving energy into heat.

Explain it: what to look for pages 19, 20

Item	Look for
19.1	The bowling ball. At the same speed, an object with more mass has more kinetic energy.
19.2	A stretched rubber band has elastic potential energy stored in it. When it snaps back, that stored energy turns into motion.
19.3	The total mechanical energy stays the same. It started at rest at its highest point, so that is all the energy it has. Any higher point would need more energy than it has.
20.1	Gravitational potential energy. The skater is stored up because of the height at the top of the ramp.
20.2	At the bottom its height is the lowest, so its potential energy is the lowest. With friction ignored, that energy has turned into the most kinetic energy.
20.3	Friction turns some of the moving energy into heat. That energy is no longer kinetic energy, so the object slows down.

Exit tickets

- Exit tickets (page 24): ticket 1 names two kinds of energy with a correct example for each; ticket 2 says potential energy goes down and kinetic energy goes up as the ball rolls down; ticket 3 is open.

PREVIEW

Kinetic and Potential Energy Tracker

One student, every scored sheet. Filled example: page 37.

Student _____ Teacher _____ Month _____

Page	Page type and set	Items	Right	Date	Notes
5	Reading 1: Moving and Stored Energy	3			
6	Reading 2: Roller Coasters and Pendulums	3			
9	Energy Words	6			
11	Who Am I?	8			
12	Label the Roller Coaster	5			
13	Label the Pendulum	4			
14	Fill In the Chart	12			
15	True or False 1	6			
16	True or False 2	6			
21	Find the Mistake	4			
22	Quiz A	6			
23	Quiz B	6			
26	Cut and Paste 1: Kinetic or Potential	12			
27	Cut and Paste 2: Three Kinds	12			

PREVIEW

How to fill this in

Write how many items the student got right with no prompt, and the date. A blank means not tried yet, never wrong. There are 93 items on the 14 scored sheets. Answer keys: pages 28 to 32. Filled example: page 37.

This month we are working on (your own standard or wording)

Team Note

Use this page between team meetings or when a student moves classes, to hand off what changed without writing a note from scratch. Everything below is observable, with a blank for the number or the wording your team already uses.

Student _____ Team member _____ Date _____

Kind of sheet	Covered since last note (Y/N)	Items right	Still blank
Readings and words			
Who am I			
Labels and chart			
True or false			
Find the mistake			
Quizzes			
Sorts			

What I saw (observable, not a conclusion)

- Named the kind of energy for ___ of 8 clues (page 11).
- Labeled ___ of 9 points and positions (pages 12, 13).
- Got ___ of 12 true or false sentences right (pages 15, 16).
- Explained in a complete sentence what happens to energy as an object falls: yes / no / with a reminder.

Next step

- Next page or set: ___, because ___ (what you saw).
- What to try in another class or at home: ___.
- What to keep doing because it is working: ___.
- Anything for the team meeting to decide: ___ (this page records what happened, never a label or a plan).

Summary, in one or two sentences, for whoever reads this next

A filled-in line, for reference

"Got 4 of 6 true or false sentences right on 10/15. Next step: reread Reading 2 and ask which change makes a roller coaster's speed go up." That is the level of detail this page is built for. It matches the filled example on page 37.

PREVIEW

Marcus's Tracker (Invented Student)

Marcus L. is invented; nothing on this page describes a real student. The blank tracker is on page 33.

Student	Teacher	Month
Marcus L. (an invented student)	Ms. Rivera (invented)	October

Page	Page type and set	Items	Right	Date	Notes
5	Reading 1: Moving and Stored Energy	3	3	10/6	-
6	Reading 2: Roller Coasters and Pendulums	3	2	10/7	Thought the stop at each end meant zero potential energy
9	Energy Words	6	5	10/8	Mixed up friction and mechanical energy
11	Who Am I?	8	-	-	-
12	Label the Roller Coaster	5	3	10/13	Named C as highest PE and D as highest KE
13	Label the Pendulum	4	-	-	-
14	Fill In the Chart	12	9	10/16	Wrote increases for the height of the falling ball
15	True or False 1	6	4	10/15	Thought friction speeds things up
16	True or False 2	6	-	-	-
21	Find the Mistake	4	-	-	-
22	Quiz A	6	5	10/20	Mixed up kinetic and potential energy
23	Quiz B	6	-	-	-
26	Cut and Paste 1: Kinetic or Potential	12	10	10/22	Put the bike and the boat in the wrong box
27	Cut and Paste 2: Three Kinds	12	-	-	-

How to read it

Marcus L. has done **8 of 14** scored sheets and got **41 of 53** items right with no prompt. **1** sheet was all right and **7** carry a note. Every number comes from the table.

What the table points to

The lowest sheet is Label the Roller Coaster (3 of 5). That is where the next practice goes. The 6 sheets left blank are not tried yet, never wrong.

PREVIEW