

SPECIAL ED

POTENTIAL ENERGY

BOOK

ACTIVITIES

EXPERIMENTS

ASSESSMENT



INCLUDES GOOGLE SLIDES



This unit was created with this guy in mind. He has autism and an intellectual disability. He is a non-reader, and loves the sound of piano keys. With some support he is able to do this unit, and enjoys the challenge. He is my tester!!

Potential & Kinetic Energy Unit

By

Christa Joy

Special Needs for Special Kids



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Also included with this unit is a power point show that is narrated and has automatic advancement of slides. Let me know in the feedback if this was helpful ☺

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This unit contains almost 200 pages of material. I have included a detailed lesson plan to help you make the most of everything in this unit including how to add some group activities.

Potential and Kinetic Energy Lesson Plan

Preparation

- Print out a vocabulary board for each student to use throughout unit
 - Laminate or place in page protector
- Book
 - Print out, laminate, and bind
 - OR your students can listen to the pre-recorded version
- Vocabulary cards
 - Print out a set of cards onto cardstock and laminate
 - Make one set for each student and also one for the teacher to use in I Spy games

Preassessment (do day 1 before starting lesson)

- Choose the form of the assessment that best fits the learning level of your students
- Give the assessment to assess what your students may already know
- I cannot emphasize enough how important this step is. If you want to see growth, this preassessment is so important!!

Teaching Tips

1. *Color Coding:* this is a really easy way to add more structure to a matching activity. Outline or color in an empty box or sorting label. Outline or color in the corresponding picture symbols the same colors. Becomes a color matching task.
 - a. For more info, read more here:
<https://specialneedsforspecialkids.org/2015/09/05/using-color-coding-for-differentiation/>
 - b. I also have a blog post on differentiating one activity 3 ways:
<https://specialneedsforspecialkids.org/2018/10/22/differentiating-1-activity-3-ways-easily-and-effectively/>
2. *Make your own copies of the activities:* Every day I review the activity we did yesterday. For that reason:
 - a. I often complete the activity myself and often laminated it for easy review that I could use year after year.
 - b. My copies were also helpful as either a model for students who needed more support or as a way for more advanced students to self-check their

The lesson plans contain:

Overall tips for teaching
students with significant
needs

Quick Look

Day	Activity	Day	Activity
1	<ul style="list-style-type: none">• Book• Vocab cards activity• Circle map	8	<ul style="list-style-type: none">• Book• Vocab cards activity• Circle one with more
2	<ul style="list-style-type: none">• Book• Vocab cards activity• Circle map	9	<ul style="list-style-type: none">• Book• Vocab cards activity• Circle one with more
3	<ul style="list-style-type: none">• Book• Vocab cards activity• Sorting activity	10	<ul style="list-style-type: none">• Book• Experiment #1
4	<ul style="list-style-type: none">• Book• Vocab cards activity• Sorting activity	11	<ul style="list-style-type: none">• Book• Experiment #2
5	<ul style="list-style-type: none">• Book• Vocab cards activity• Sorting activity	12	<ul style="list-style-type: none">• Book• Vocab cards activity• Close worksheet
6	<ul style="list-style-type: none">• Book• Vocab cards activity• Flash card activity	13	<ul style="list-style-type: none">• Book• Vocab cards activity• Close worksheet
7	<ul style="list-style-type: none">• Book• Vocab cards activity• Flash card activity	14	<ul style="list-style-type: none">• Assessment

The lesson plans contain:

A quick look at what you will do each day

Day 5

Activity	Notes	Materials
Read or listen to a recording of the book (10 minutes)	<ul style="list-style-type: none">• Read through the story, asking lots of questions• Continue to make connections between book and vocabulary board	<ul style="list-style-type: none">• Book• Vocabulary board
Vocabulary cards speed game (15 minutes)	<ul style="list-style-type: none">• Place the finished vocabulary cards in the middle of the table• Either hold up or describe a card and the student who can find it first wins and keeps the card• The student with the most cards at the end is the winner	<ul style="list-style-type: none">• Vocabulary cards• Vocabulary board
Review (5 minutes)	<ul style="list-style-type: none">• Review the sorting activity from yesterday	<ul style="list-style-type: none">• Finished sorting activity
Sorting Activity (10 minutes)	<ul style="list-style-type: none">• Complete the translational vs rotational kinetic energy sorting activity using the photos, symbols or both• Use color coding as needed	<ul style="list-style-type: none">• Sorting activity• Scissors• Glue
Sharing (10 minutes)	<ul style="list-style-type: none">• Each student shares their finished sorting activity	<ul style="list-style-type: none">• Completed activity• Communication devices

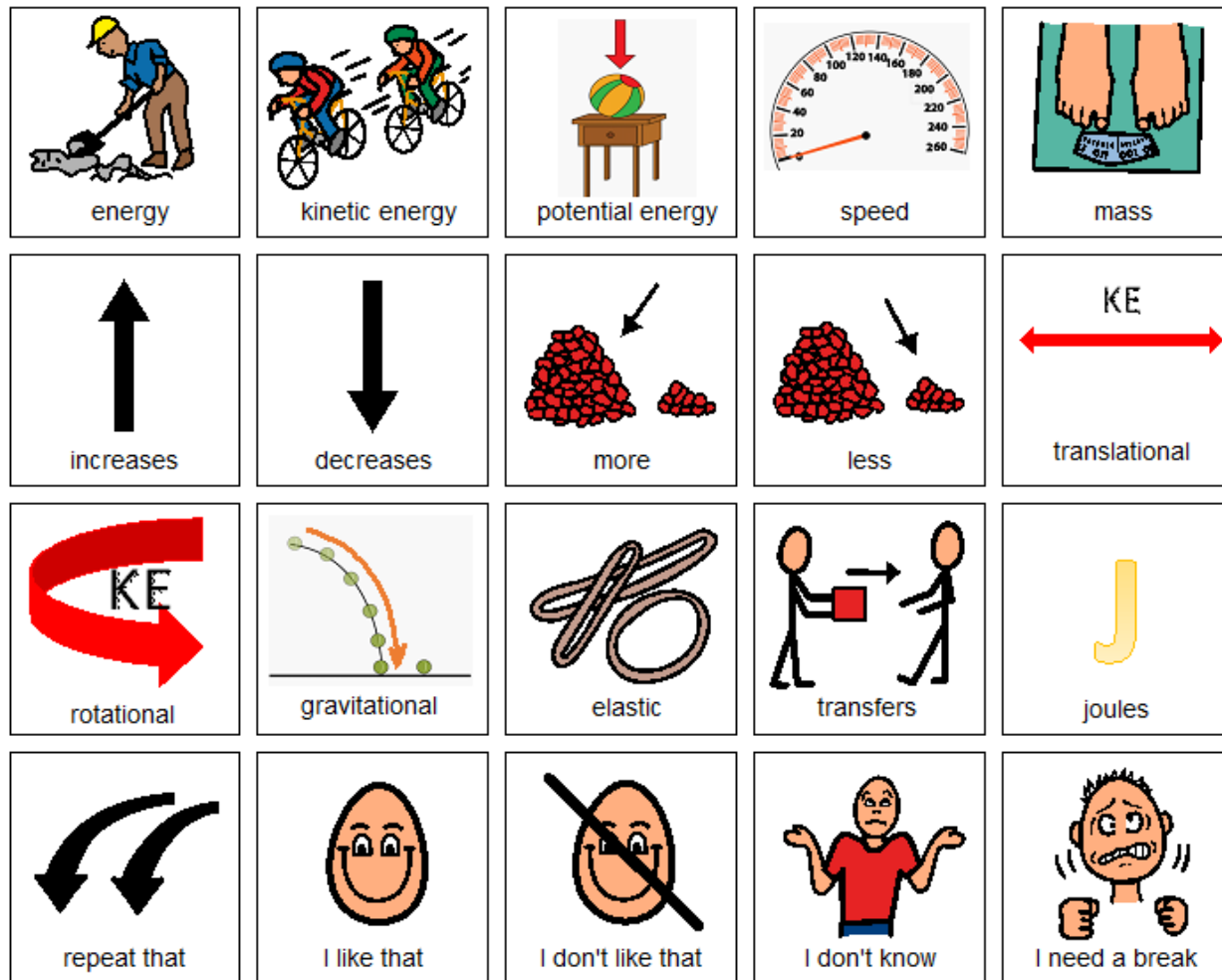
The lesson plans contain:

Detailed instructions on how that day's lesson should run

This unit comes with a vocabulary board.

Vocabulary boards are great for ALL students to assist with participation and engagement in group discussions.

Tips on how to use in the unit!!



Every single object that moves has kinetic energy.



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Unlike kinetic energy, potential energy is the energy an object has that is NOT moving. It is stored energy.



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There is a book with this unit using simple text and photos. It is 67 pages and is an overview of potential and kinetic energies.

Both come in pdf versions as well as a voice-recorded powerpoints (so you don't have to print it out.)

energy

Ability to do work.



Law of Conservation of Energy

Energy cannot be created or destroyed. It can only change.



kinetic energy

Energy of things in motion.



Lord Kelvin

First scientist to use the term kinetic energy in 1849.



joules

Unit of measurement for energy.



speed

How fast an object is moving.



mass

How much an object weighs.



Translational kinetic energy

Movement through space from one point to another.

KE



There are 14 vocabulary cards that come in color and black and white.

Included are suggestions for group activities to do with these each day.

rotational kinetic energy

Spinning movement around an axis.



axis

Imaginary line that goes through the center of the Earth from top to bottom.



potential energy

Stored energy.

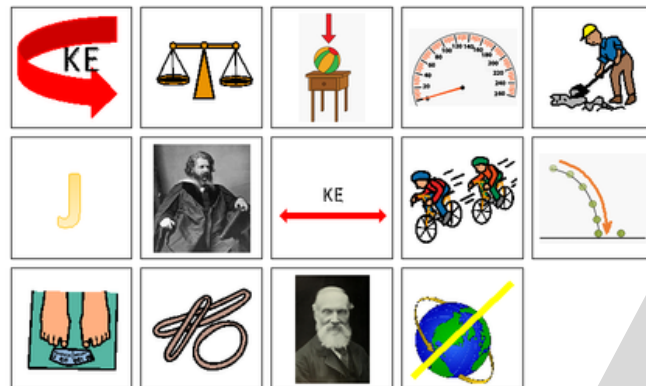


William Rankine

First scientist to use the term potential energy in 1800's.

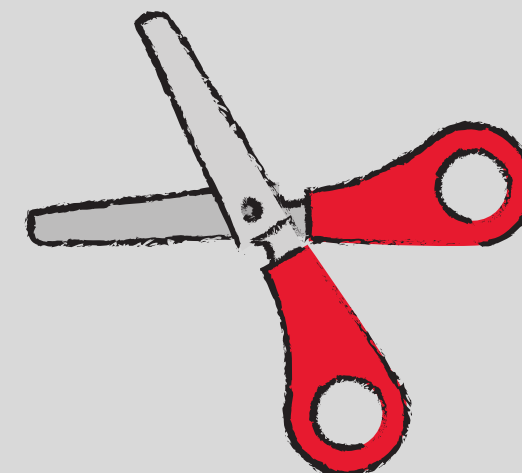


Match the pictures with the definitions on the previous pages.



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There is an activity where students will match either the picture to the definition or the definition to the picture (harder).



joules



speed



mass



Translational kinetic energy







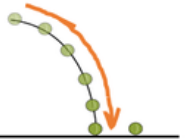

KE



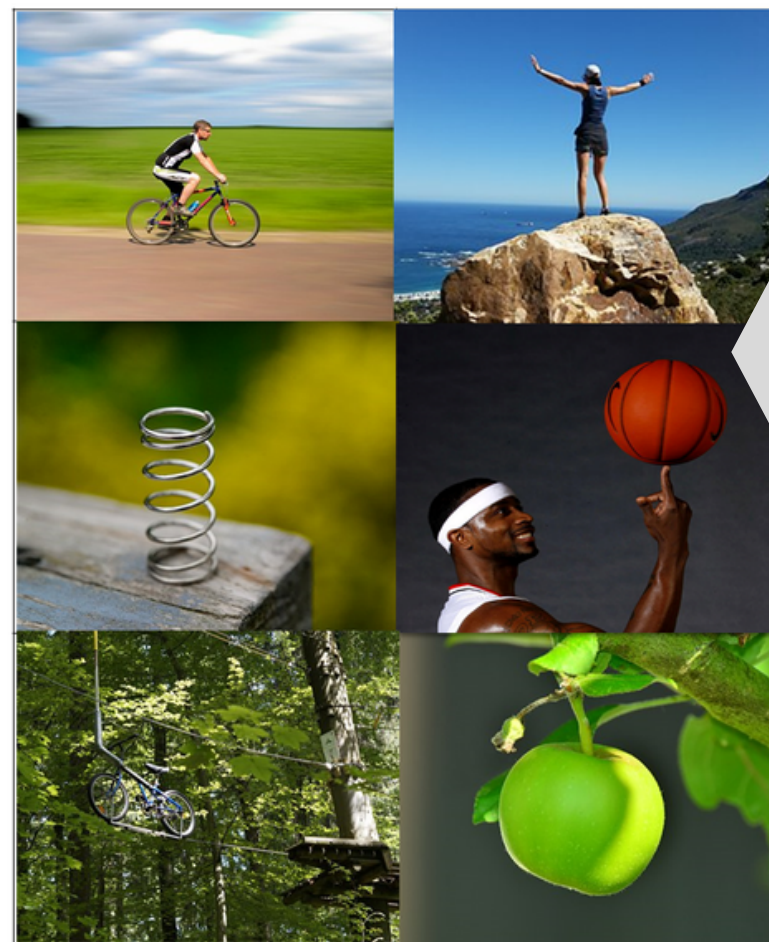
Match the definition to the pictures on the previous pages.

Measurement for	Spinning movement around an axis.	Energy cannot be created or destroyed. It can only change.
Energy in a stretch of a rubber band	First scientist to use the term potential energy in 1800's.	Stored energy.
How to work.	How fast an object is moving.	Stored energy that comes from the pull of Earth's gravity. The higher an object is, the more gravitational energy it has.
Movement through space from one point to another.	Imaginary line that goes through the center of the Earth from top to bottom.	Energy of things in motion.

Type of Energy label cards used for students to hold up when you show a picture identifying the correct form of energy.

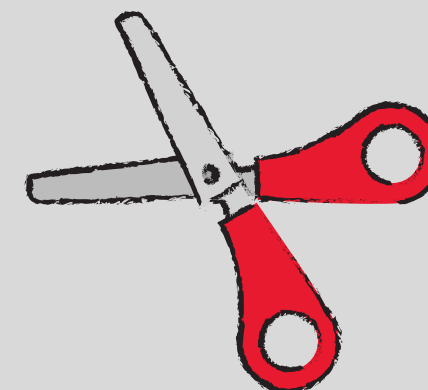
KINETIC ENERGY 	POTENTIAL ENERGY 
TRANSLATIONAL ENERGY KE 	ROTATIONAL ENERGY 
GRAVITATIONAL ENERGY 	ELASTIC ENERGY 

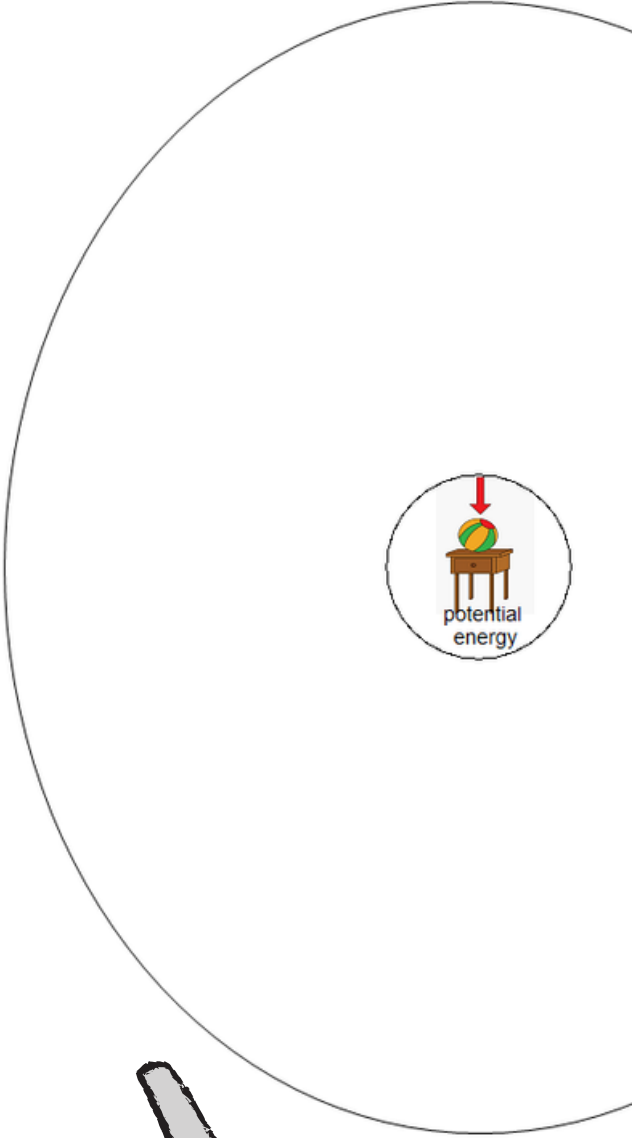
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There is a set of flash cards.
There are 24 photos and 6
category labels. Students will
identify the type of energy in
each photo.





Errorless version

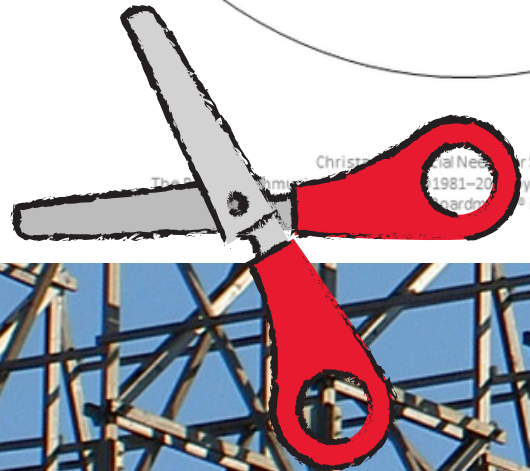
Cut apart pictures and place in circle map about potential energy.

energy	gravitational	elastic	joules	on top of
stored	trampoline	spring	William Rankine	bow



Cut apart pictures and place in circle map **ONLY IF** they relate to potential energy.

energy	gravitational	auto race	joules	on top of
stored	trampoline	spring	fall	bow
rotational	flying	elastic	William Rankine	bounce



There are 2 circle maps. There is one for potential and one for kinetic energy.

Circle maps are a great way for students to see the concept at a glance.

There are 2 versions:

















- One is errorless
- One has wrong answers mixed in students will have to set aside

Objects with more mass have more kinetic energy. Circle the one that has **MORE** kinetic energy in each box. Assume each object is in motion and they are going the **same speed**.

















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Objects with less height have less potential energy. Circle the one that has **LESS** potential energy in each box. Assume each object is **NOT** in motion.

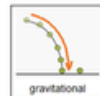
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Objects with less mass have less potential energy. Circle the one that has **LESS** potential energy in each box. Assume each object is **NOT** in motion and positioned at the same height.

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There are 4 worksheets where students will decide which object has more or less potential or kinetic energy. Suggestions for differentiation are included.



stored energy	trampoline	chase	sit	translational
gravitational	Lord Kelvin	lamp on dresser	energy in motion	hiking
William Rankine	rotational	spin	bowling pins	elastic

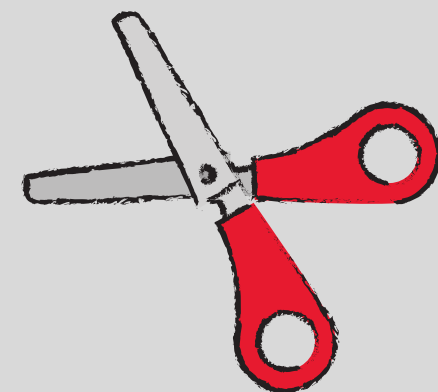


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There are 3 sorting activities. Each has the option to use photos or picture symbols. Suggestions for differentiation are included

earth spins	throw	salad spinner	rocket	go around
running	hopping	tetherball	axis	jump rope
spin	wiggle	flying	swimming	turn





Potential Energy Experiment #1

The Incline Roll

People on my team: _____

Materials needed:

 <input type="checkbox"/>	1 <input type="checkbox"/>
incline	object
 <input type="checkbox"/>	2 <input type="checkbox"/>
scale	object
	3 <input type="checkbox"/>
	object

Potential Energy Experiment #1

The Incline Roll

Data collection

Objects chosen (3)

Record weights

<input type="text"/>	_____
<input type="text"/>	_____
<input type="text"/>	_____

Potential Energy Experiment #1

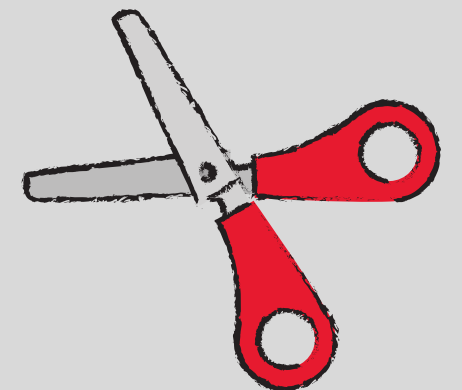
The Incline Roll

Place the objects in order from lightest to heaviest

My hypothesis

I think will get to the bottom first
because it is .

There are 2 experiments that walk students through the scientific method step by step using pictures.



Potential Energy Experiment #1

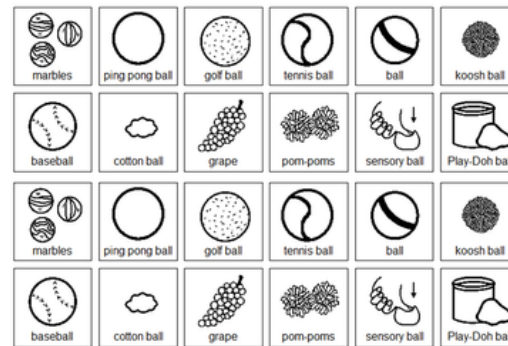
The Incline Roll

What I learned

The something weighs, the it goes.

The something weighs, the it goes.

Pictures to use (if needed)



For hypothesis

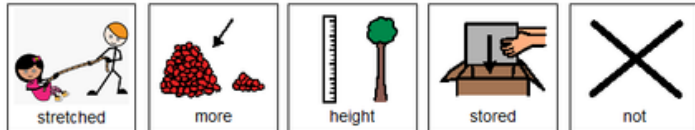


For what I learned



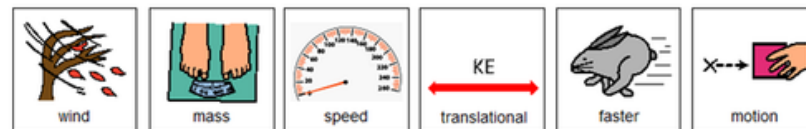
Potential Energy

1. Potential energy is also called energy.
2. Gravitational energy is determined by the object's .
3. Elastic energy is determined by how far something is .
4. Something that has potential energy is moving.
5. An apple at the top of the tree has potential energy than one at the bottom.



Kinetic Energy

1. Kinetic energy is energy in .
2. The more something has the more kinetic energy it has.
3. The in a tornado has a lot of kinetic energy.
4. A train has more kinetic energy than a bike because it goes and has more .
5. Objects that move through space have energy.



There are 4 close worksheets that are a great informal assessment. There are 2 for each type of energy.

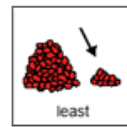
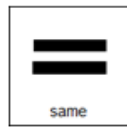
Answer key included.



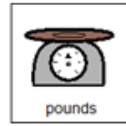
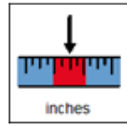
1. The definition of energy is the ability to:



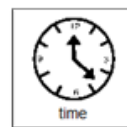
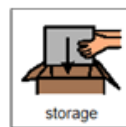
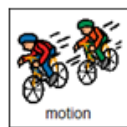
2. The Law of Conservation of Energy says the amount of energy an object has is always the:



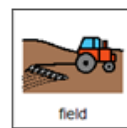
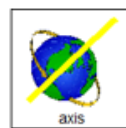
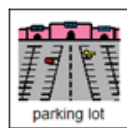
3. Energy (kinetic and potential) is measured in:



4. Kinetic energy is energy that is in:



5. Rotational energy measures movement around an:

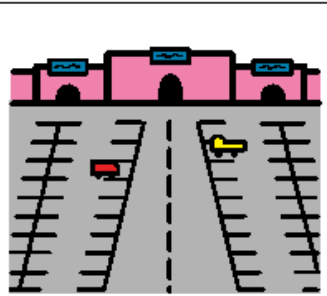


FINALLY the assessment!!
There are 3 versions. This version has 10 questions with 3 picture choices for each question.

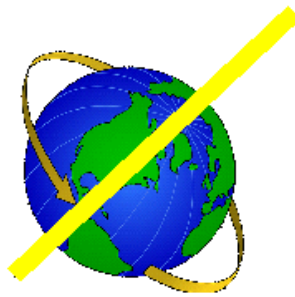
Answer key included.

Print onto cardstock or mount on index cards. Cut pictures apart and show student answer choices for each question.

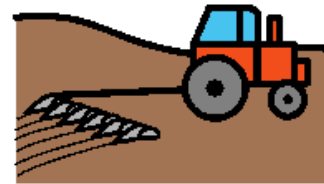
Q 5



parking lot



axis



field

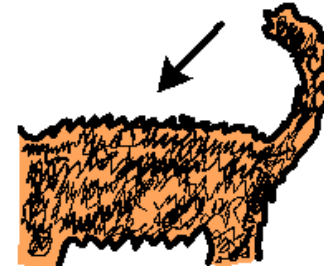
Q 6



speed



elastic



fur

With this version, you cut out the answer choices and glue them on index cards. Ask the student the question, and they point to the correct answer.

1. The definition of energy is the ability to:
 - A. Sleep
 - B. Do work
 - C. Eat
2. The Law of Conservation of Energy says the amount of energy an object has is always the:
 - A. Same
 - B. Most
 - C. Least
3. Energy (kinetic and potential) is measured in:
 - A. Inches
 - B. Pounds
 - C. Joules
4. Kinetic energy is energy that is in:
 - A. Motion
 - B. Storage
 - C. time
5. Rotational energy measures movement around an:
 - A. Parking lot
 - B. Axis
 - C. Field
6. If two moving objects weigh the same, the one with more _____ has more kinetic energy.
 - A. Speed
 - B. Elastic
 - C. fur

This is your traditional multiple choice version. It can also be used as a recording sheet if your students are using the version with index cards.

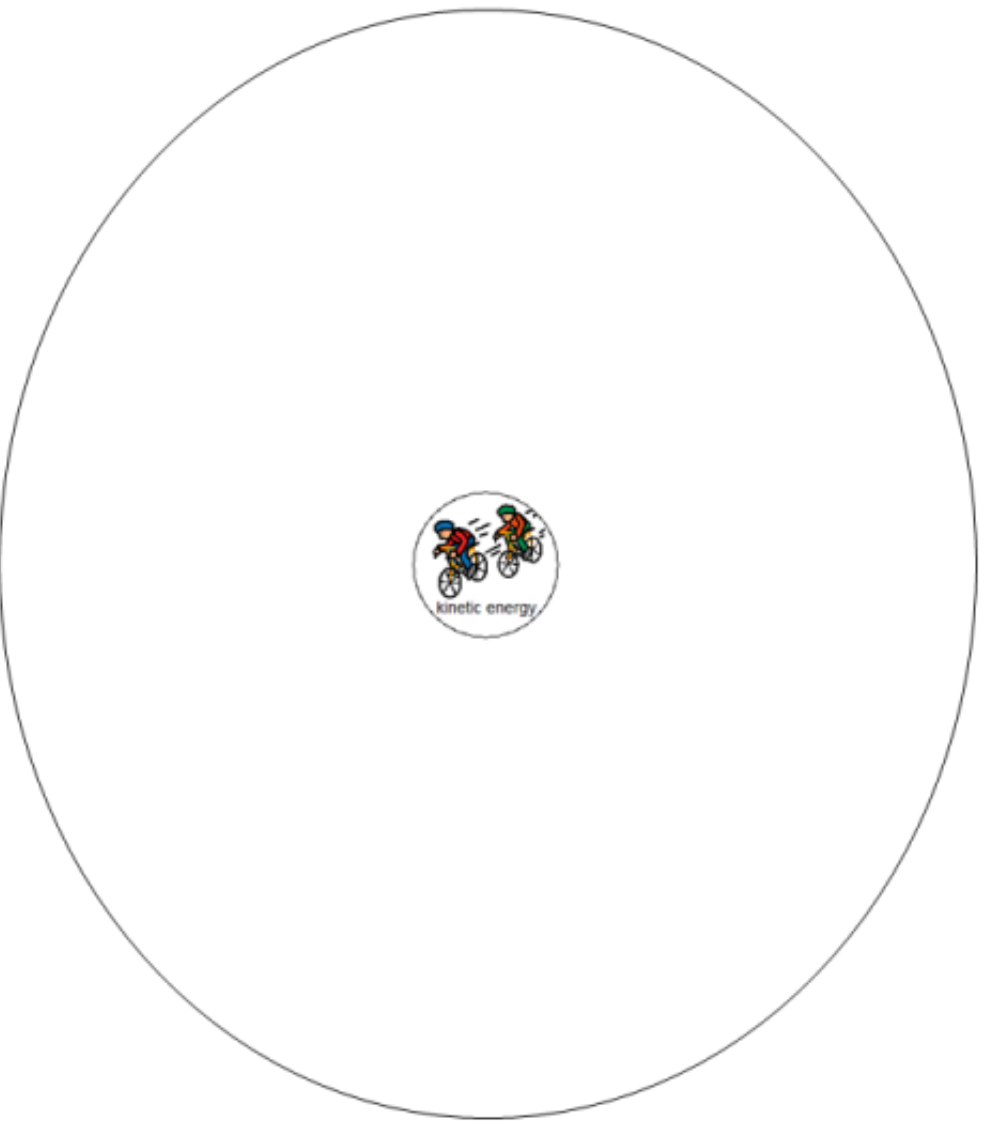
Remember how energy cannot be created or destroyed? One really cool thing is that objects can transfer their energy to one another!



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Watch the movie
on potential and
kinetic energy

*This unit also has
digital activities.
There is a movie
version of the books
students can listen to
read aloud.*



Day 2
differentiated

Place pictures in circle map about kinetic energy.

 energy	 rotational	 flying	 joules
 translational	 spin	 jump rope	
 throw	 turn		

The digital activities have students click and drag their answers.





Day 4
differentiated

Sort the pictures into the correct column. If you are not sure, place it on the middle line.

 earth spins	 swimming	 tetherball	 go around
 running	 spin	 rocket	 jump
 throw	 wiggle	 flying	 turn
 hopping	 salad spinner	 axis	

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There are 2 sets of slides. One set has color-coding for more support.



I realize there will be some students out there unable to do cutting activities. I have a blog post with ways to complete activities without a pair of scissors!!

All of the activities (except the book) come in color and black and white.

[Click Here to read more!!](#)