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



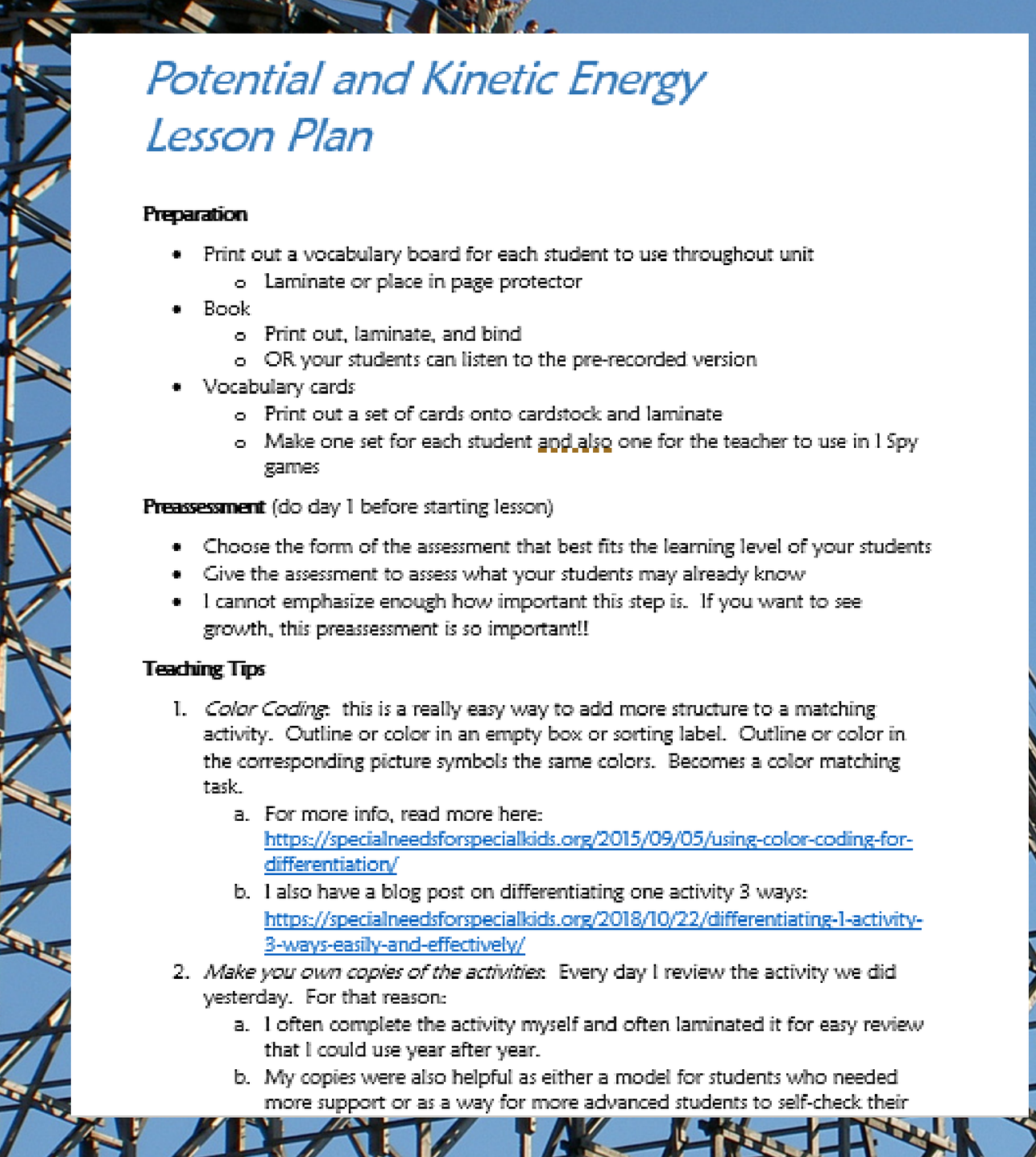
## Table of Contents



*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 ☺*



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)

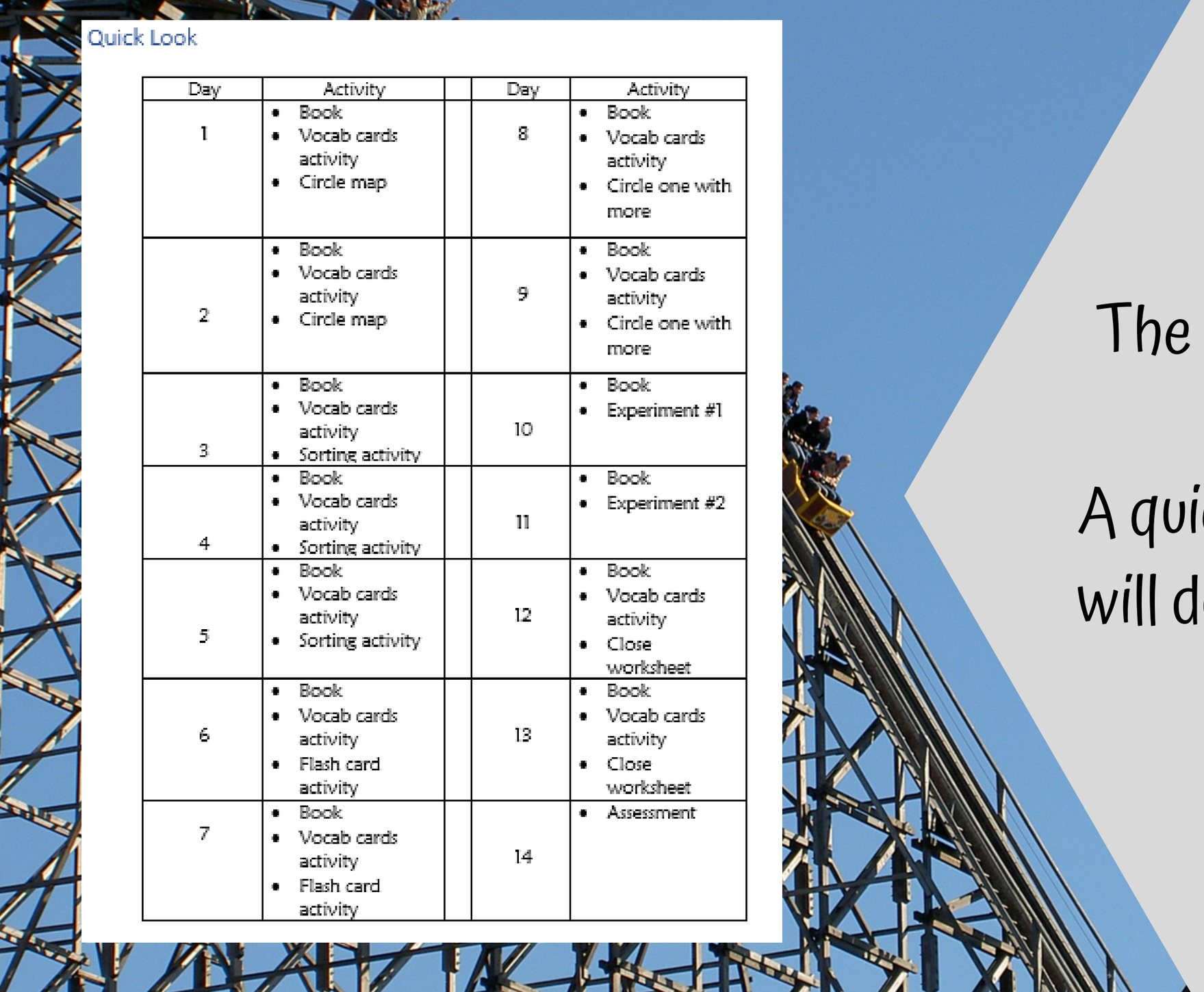
- Choose the form of the assessment that best fits the learning level of your students
- Give the assessment to assess what your students may already know
- I cannot emphasize enough how important this step is. If you want to see growth, this preassessment is so important!!

**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 you 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

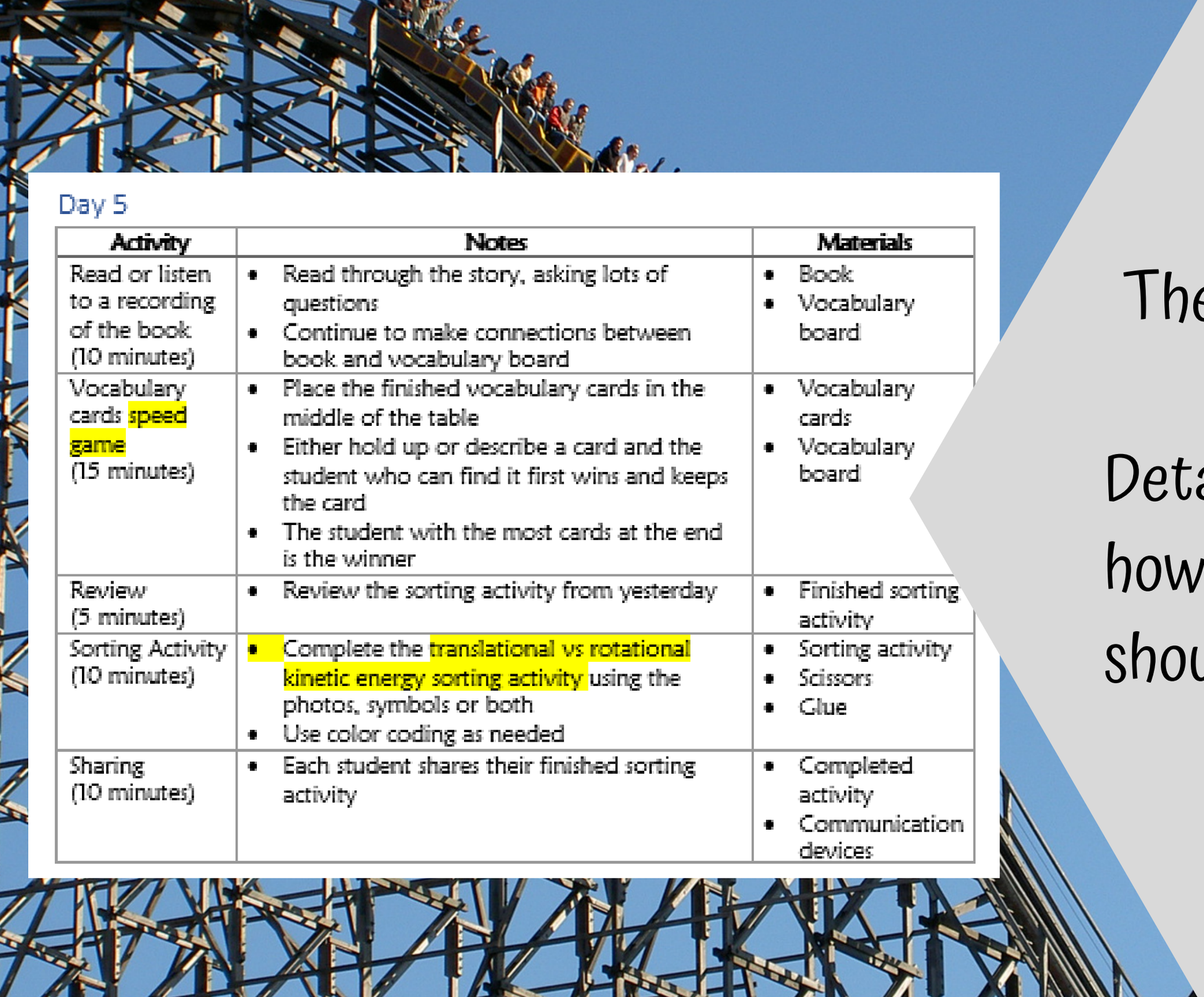


## Quick Look

| Day | Activity | | Day | Activity |
|---|---|---|---|---|
| 1 | • Book<br>• Vocab cards activity<br>• Circle map | | 8 | • Book<br>• Vocab cards activity<br>• Circle one with more |
| 2 | • Book<br>• Vocab cards activity<br>• Circle map | | 9 | • Book<br>• Vocab cards activity<br>• Circle one with more |
| 3 | • Book<br>• Vocab cards activity<br>• Sorting activity | | 10 | • Book<br>• Experiment #1 |
| 4 | • Book<br>• Vocab cards activity<br>• Sorting activity | | 11 | • Book<br>• Experiment #2 |
| 5 | • Book<br>• Vocab cards activity<br>• Sorting activity | | 12 | • Book<br>• Vocab cards activity<br>• Close worksheet |
| 6 | • Book<br>• Vocab cards activity<br>• Flash card activity | | 13 | • Book<br>• Vocab cards activity<br>• Close worksheet |
| 7 | • Book<br>• Vocab cards activity<br>• Flash card activity | | 14 | • Assessment |

The lesson plans contain:

A quick look at what you will do each day

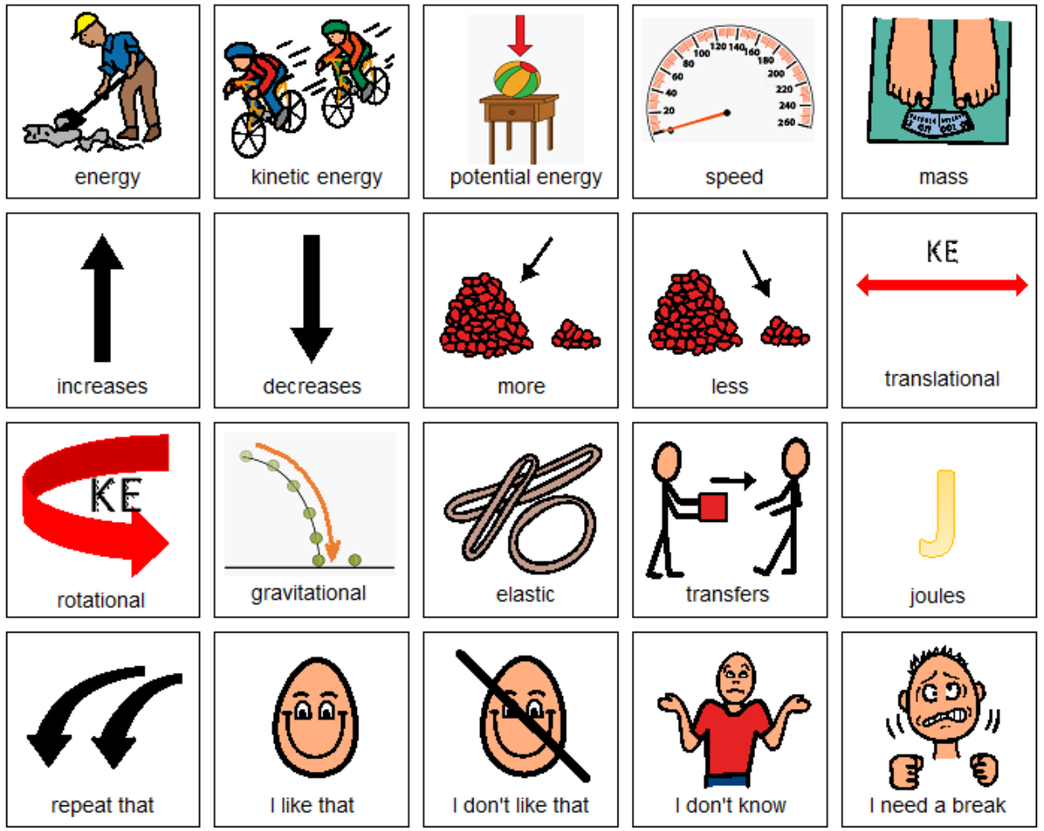


## Day 5

| Activity | Notes | Materials |
|---|---|---|
| Read or listen to a recording of the book (10 minutes) | • Read through the story, asking lots of questions<br>• Continue to make connections between book and vocabulary board | • Book<br>• Vocabulary board |
| Vocabulary cards speed game (15 minutes) | • Place the finished vocabulary cards in the middle of the table<br>• Either hold up or describe a card and the student who can find it first wins and keeps the card<br>• The student with the most cards at the end is the winner | • Vocabulary cards<br>• Vocabulary board |
| Review (5 minutes) | • Review the sorting activity from yesterday | • Finished sorting activity |
| Sorting Activity (10 minutes) | • Complete the translational vs rotational kinetic energy sorting activity using the photos, symbols or both<br>• Use color coding as needed | • Sorting activity<br>• Scissors<br>• Glue |
| Sharing (10 minutes) | • Each student shares their finished sorting activity | • Completed activity<br>• Communication devices |

The lesson plans contain:

Detailed instructions on how that day's lesson should run

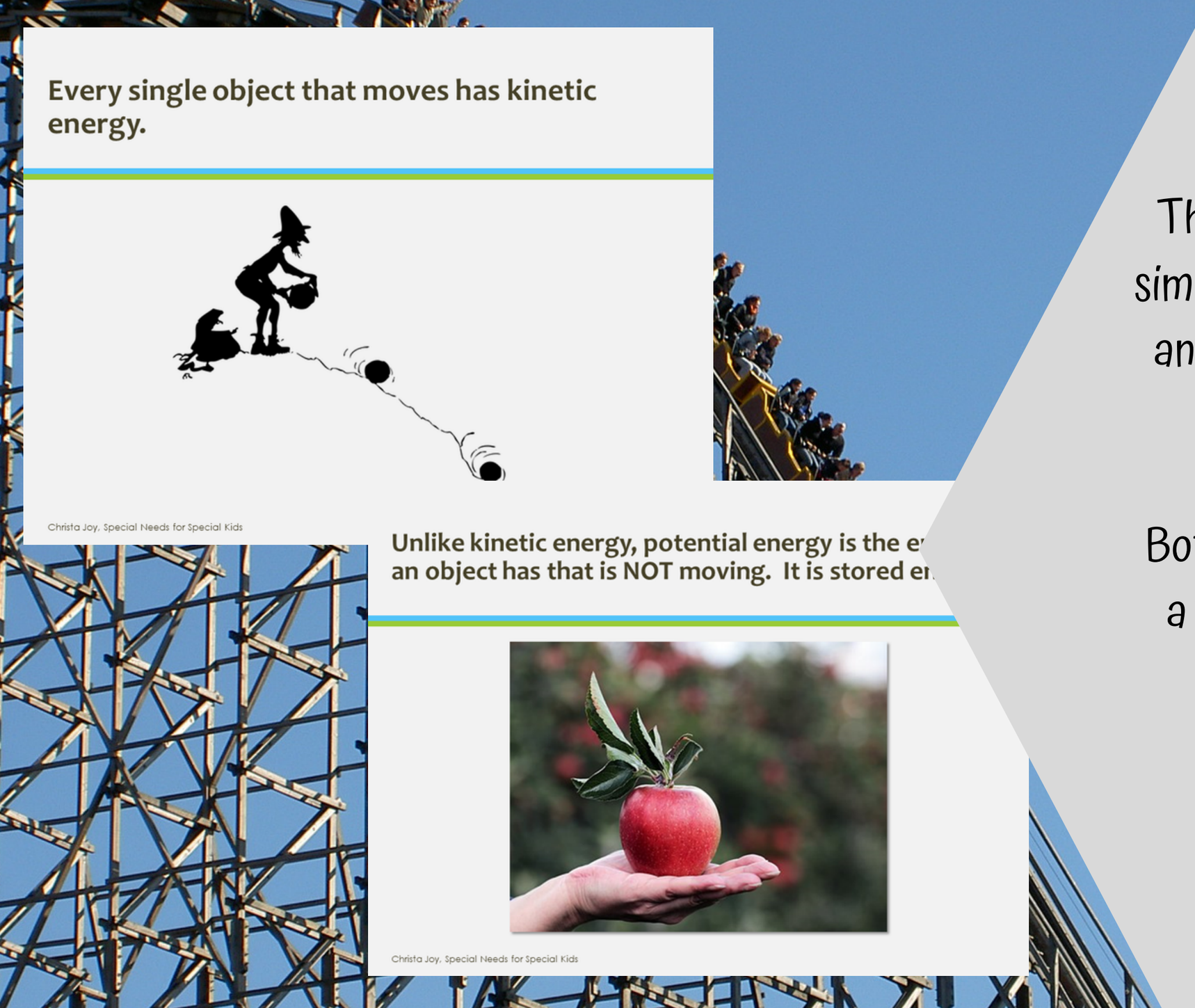





This unit comes with a vocabulary board.

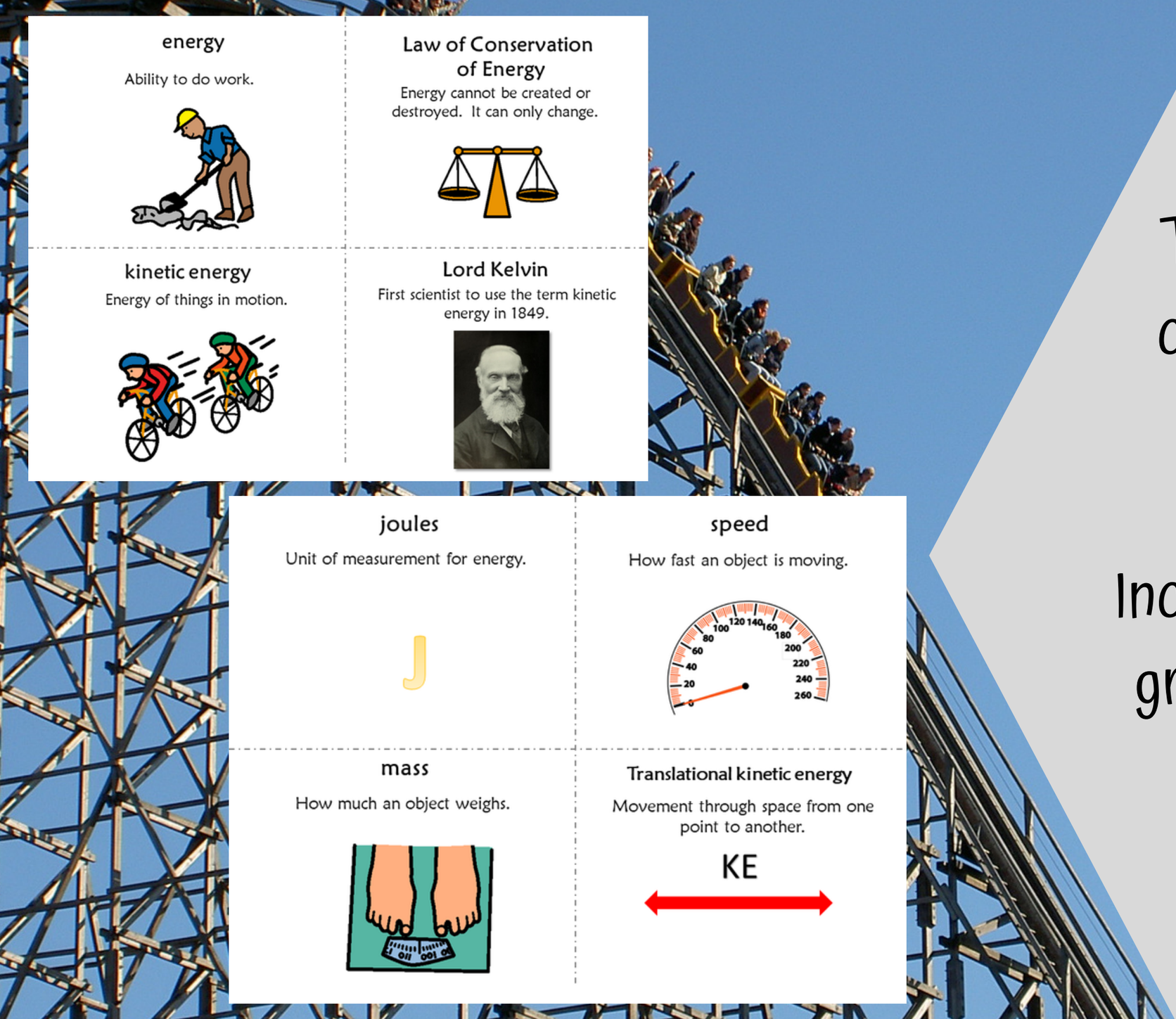
Vocabulary boards are great for ALL students to assist with participation and engagement in group discussions.

Tips on how to use in the unit!!




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.)




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.

**joules**

J

**speed**


**mass**

**Translational kinetic energy**

KE

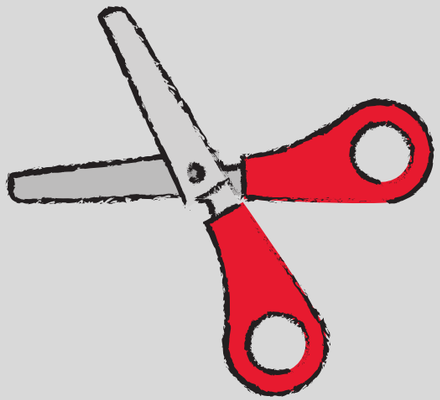
Match the pictures with the definitions on the previous pages.



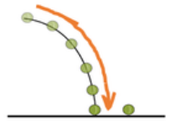

…e definition to the pictures on the previous pages.

| | | |
|---|---|---|
| …asurement for | Spinning movement around an axis. | Energy cannot be cre… destroyed. It can only change. |
| …gy in a stretch …a rubber band | First scientist to use the term potential energy in 1800's. | Stored energy. |
| …lo 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. |

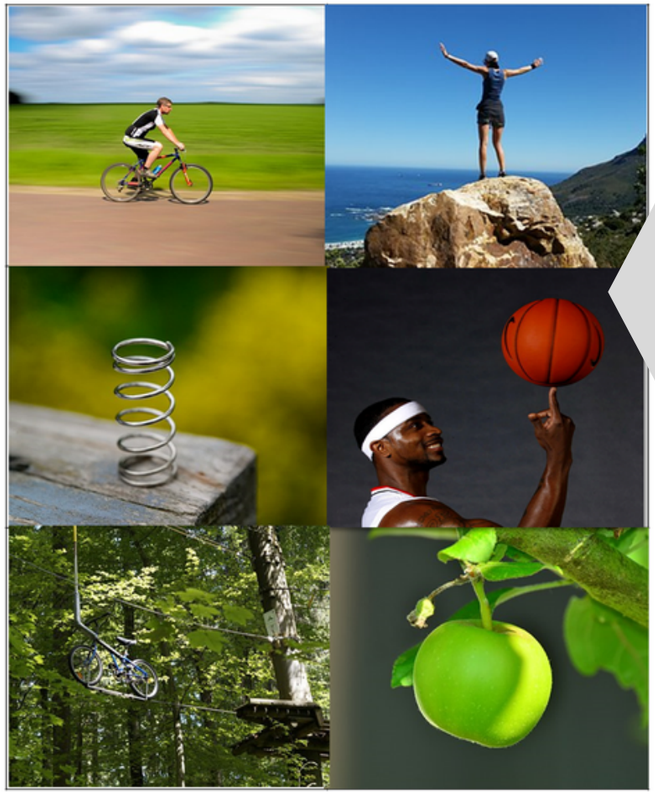
There is an activity where students will match either the picture to the definition or the definition to the picture (harder).



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

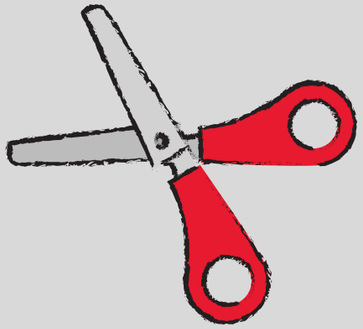
| | |
|---|---|
| KINETIC ENERGY  | POTENTIAL ENERGY  |
| TRANSLATIONAL ENERGY KE  | ROTATIONAL ENERGY  KE |
| GRAVITATIONAL ENERGY  | ELASTIC ENERGY  |

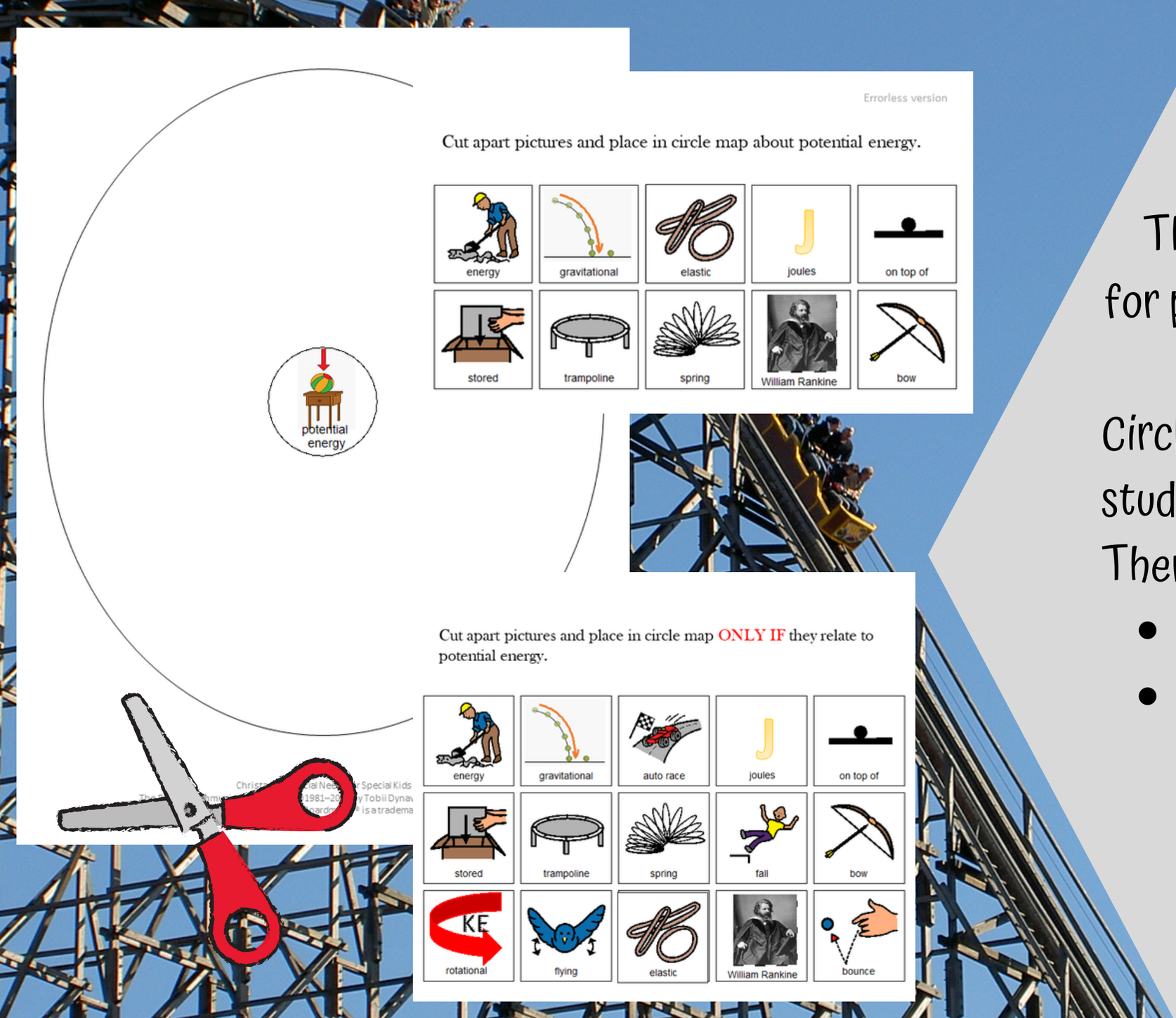






There is a set of flash cards. There are 24 photos and 6 category labels. Students will identify the type of energy in each photo.

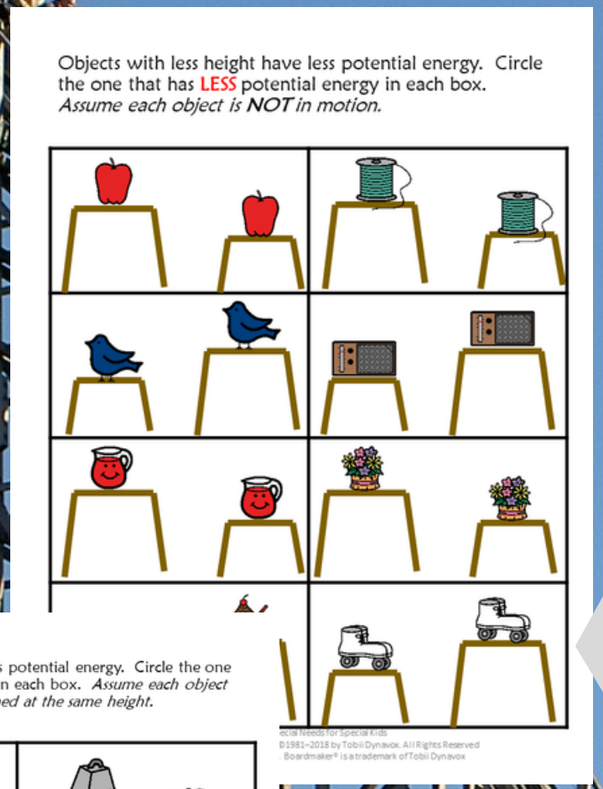


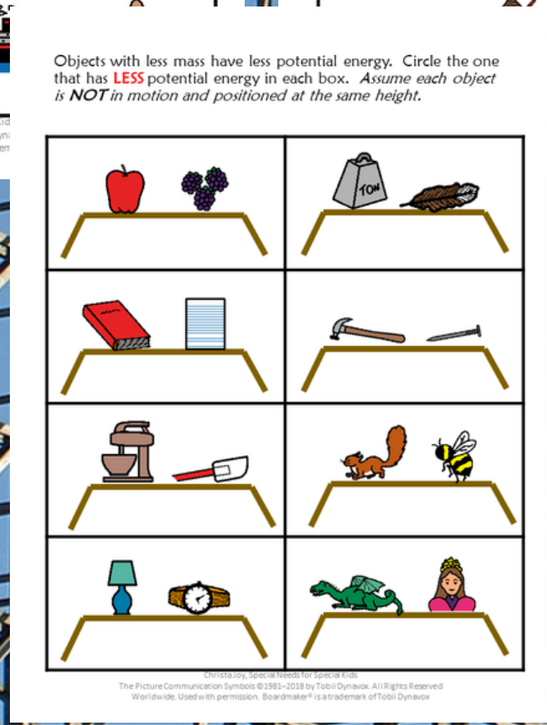



There are 2 circle maps. There is one for potential and one for kinetic energy.

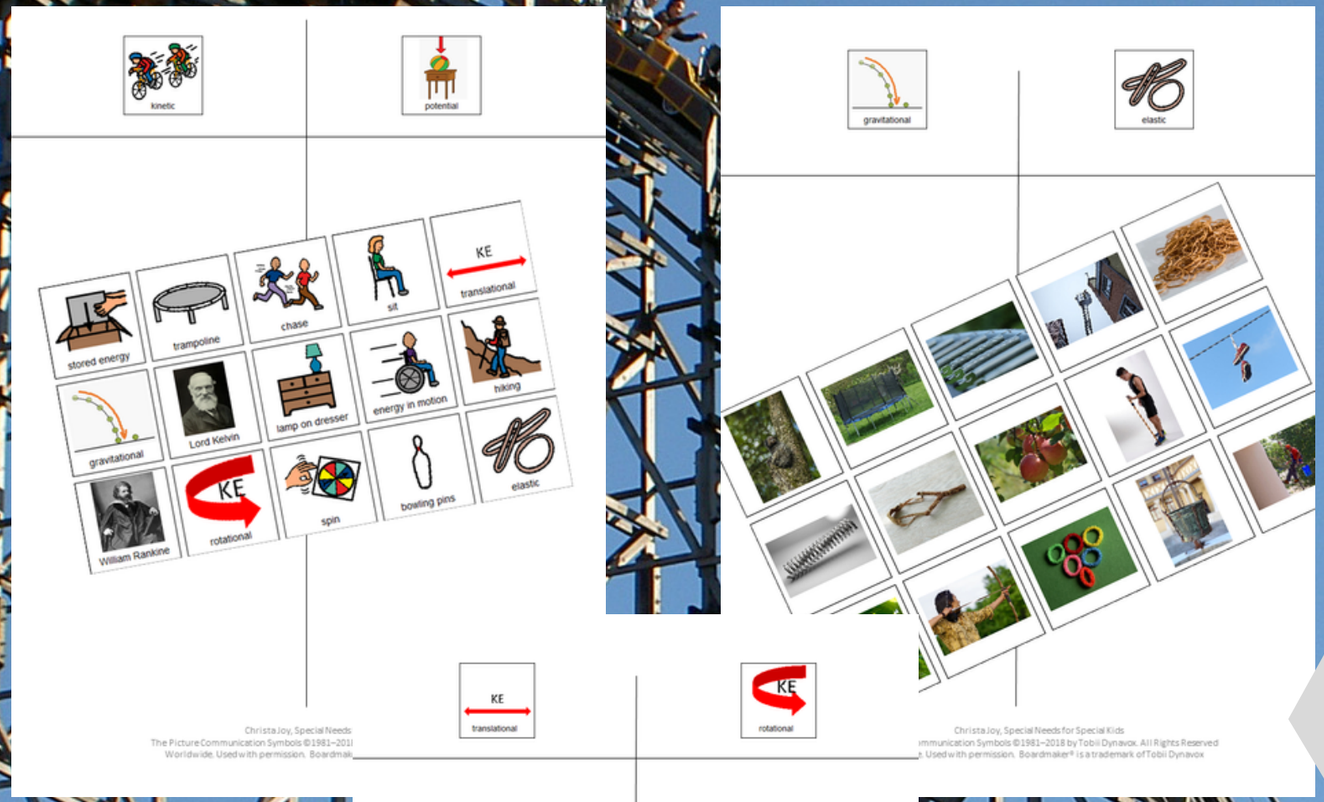
Circle maps are a great way for students to see the concept at a glance. There are 2 versions:

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

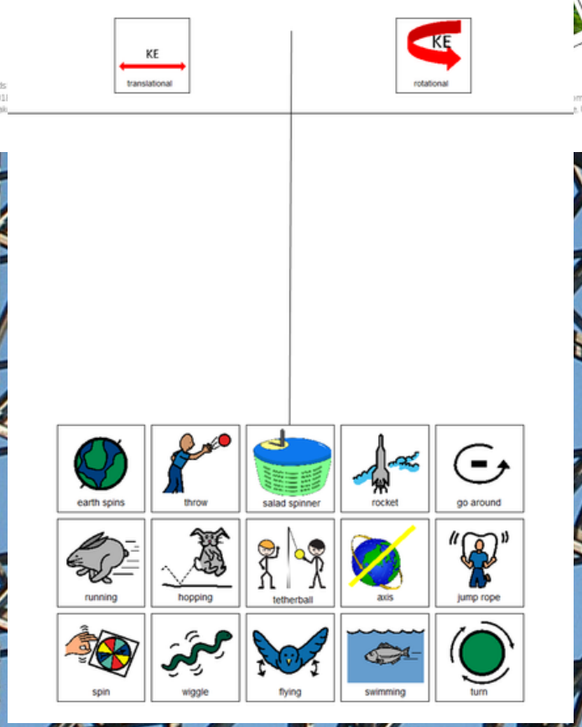




There are 4 worksheets where students will decide which object has more or less potential or kinetic energy. Suggestions for differentiation are included.

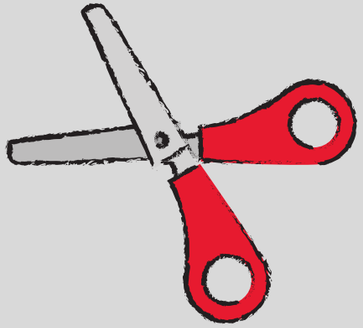









There are 3 sorting activities. Each has the option to use photos or picture symbols. Suggestions for differentiation are included



Potential Energy Experiment #1

The Incline Roll

People on my team: _____ _____

_____ _____

Materials needed:








Potential Energy Experiment #1

The Incline Roll

Data collection

Objects chosen (3)

Record weights

_____

_____

_____





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 _____ .



Potential Energy Experiment #1

The Incline Roll

What I learned

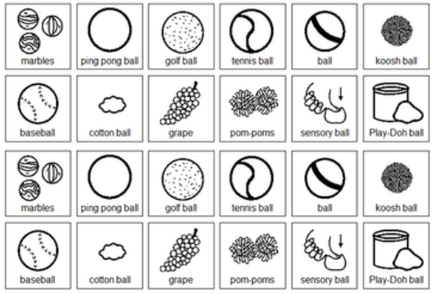
The _____ something weighs, the _____ it goes.

The _____ something weighs, the _____ it goes.





Pictures to use (if needed)

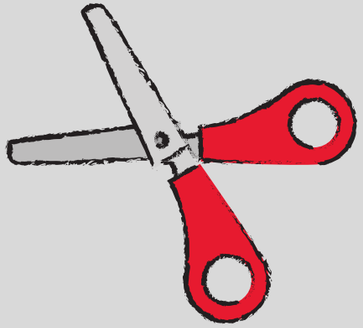



For hypothesis


For what I learned

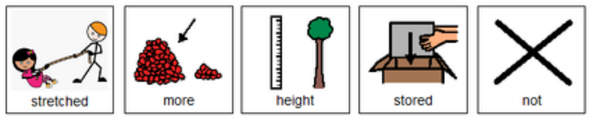



There are 2 experiments that walk students through the scientific method step by step using pictures.



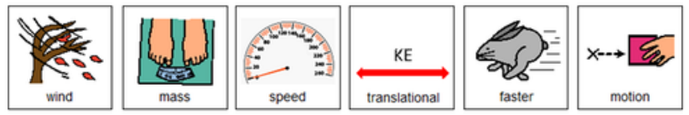
## Potential Energy

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.



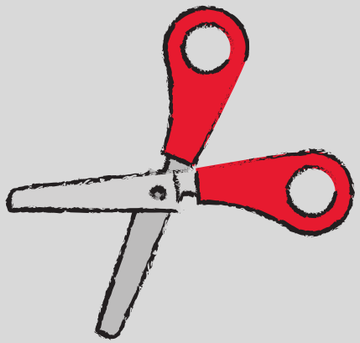

## Kinetic Energy

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.

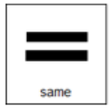
Answer key included.

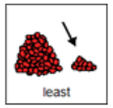


Version 1

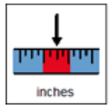
1. The definition of energy is the ability to:


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

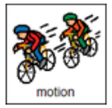




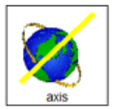

3. Energy (kinetic and potential) is measured in:




4. Kinetic energy is energy that is in:




5. Rotational energy measures movement around an:





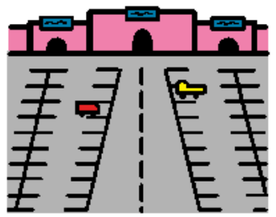

FINALLY the assessment!! There are 3 versions. This version has 10 questions with 3 picture choices for each question.

Answer key included.

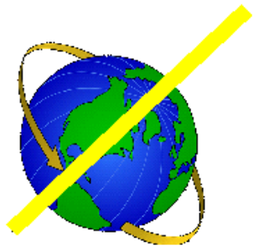
Version 2

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

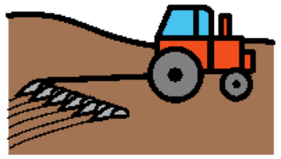
Q 5



parking lot



axis

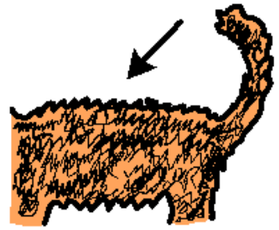


field

Q 6


speed

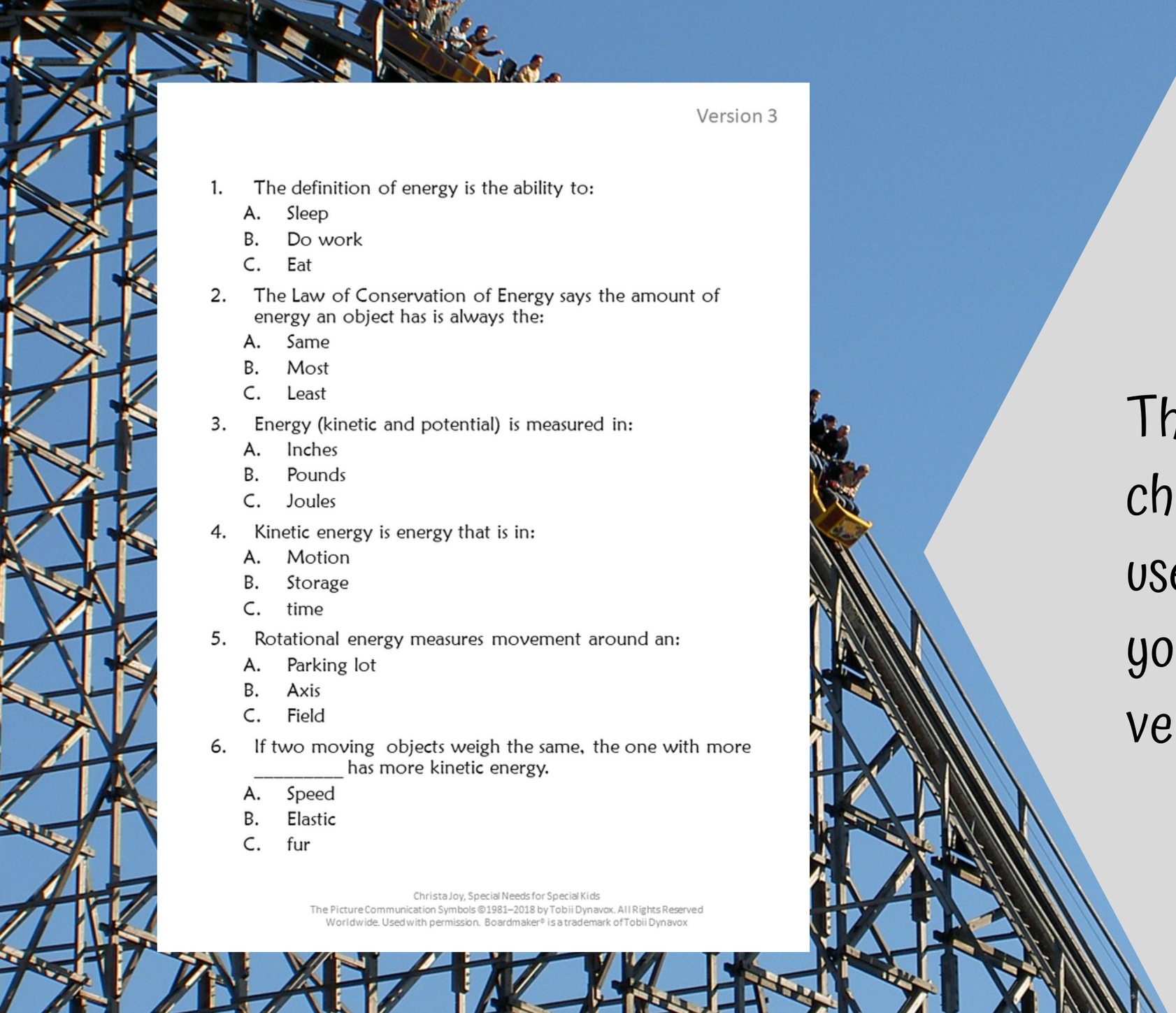
elastic



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.



Version 3

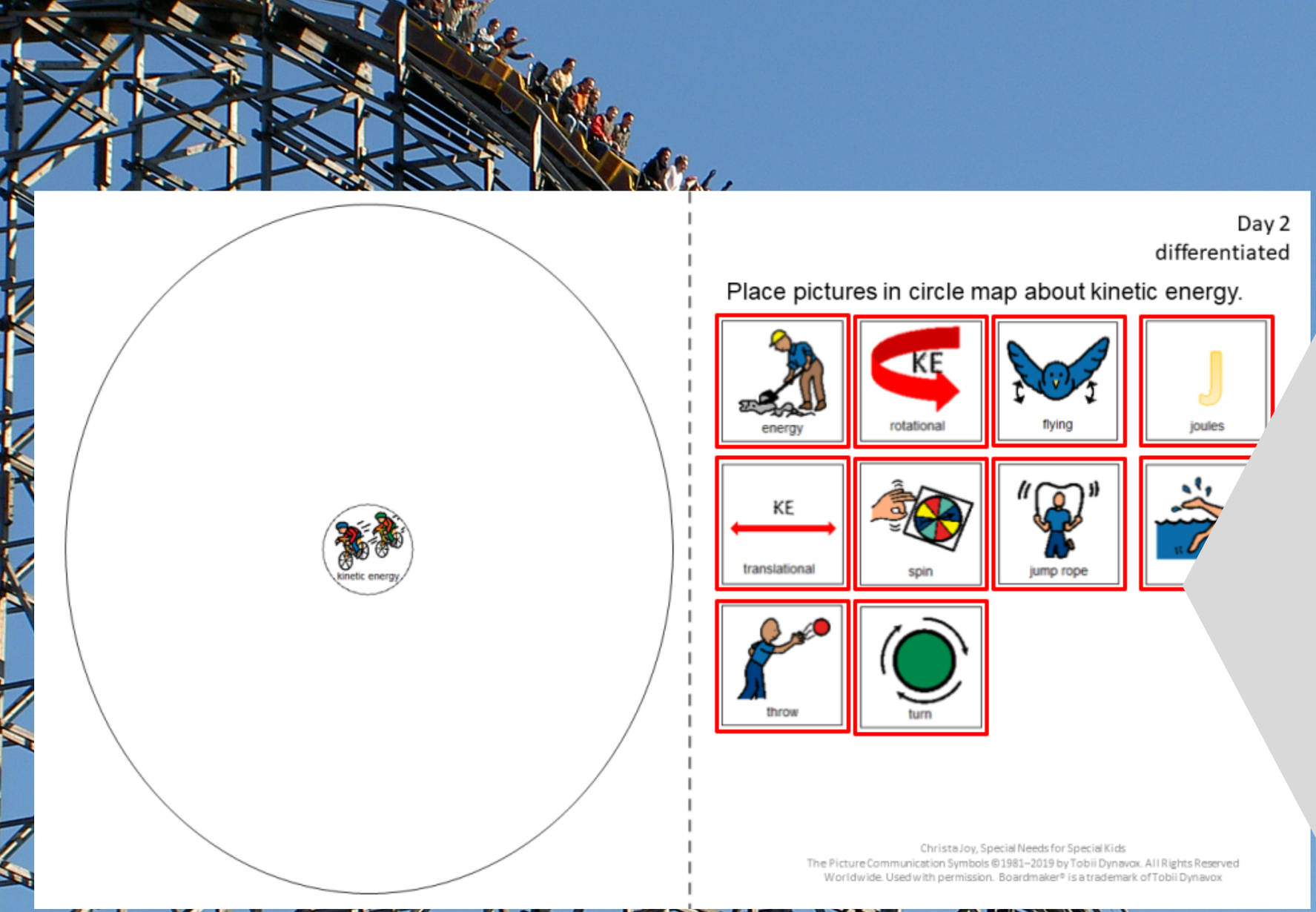
1. The definition of energy is the ability to:
   A. Sleep
   B. Do work
   C. Eat
2. The Law of Conservation of Energy says the amount of energy an object has is always the:
   A. Same
   B. Most
   C. Least
3. Energy (kinetic and potential) is measured in:
   A. Inches
   B. Pounds
   C. Joules
4. 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.

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.



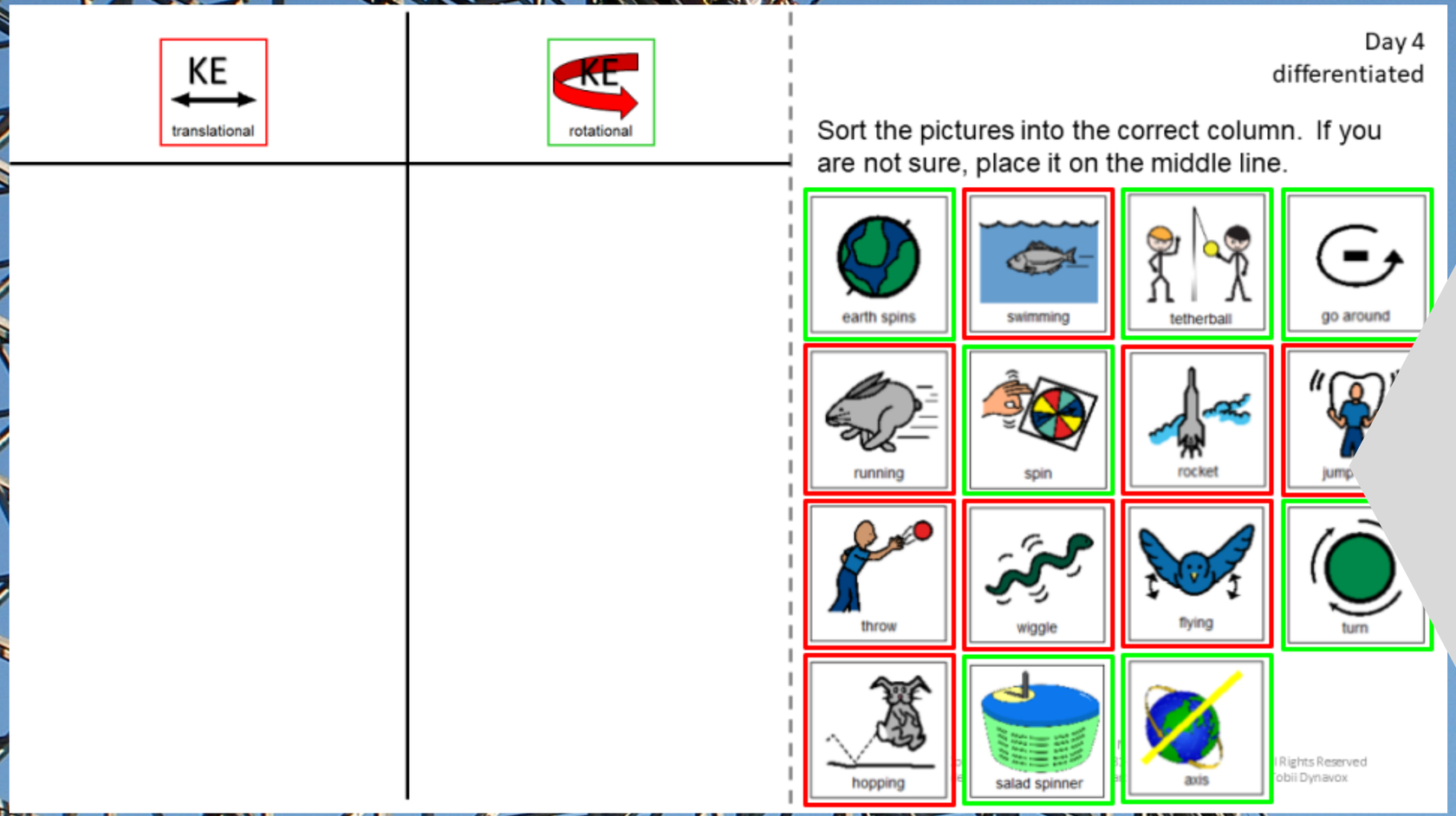

Day 2
differentiated

Place pictures in circle map about kinetic energy.






The digital activities have students click and drag their answers.




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!!**