THERMAL ENERGY

For Special Ed

Special Needs for Special Kids

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 to sit around a campfire. With some support he is able to do this unit, and enjoys the challenge. He is my tester!!

Effect of Heat Unit

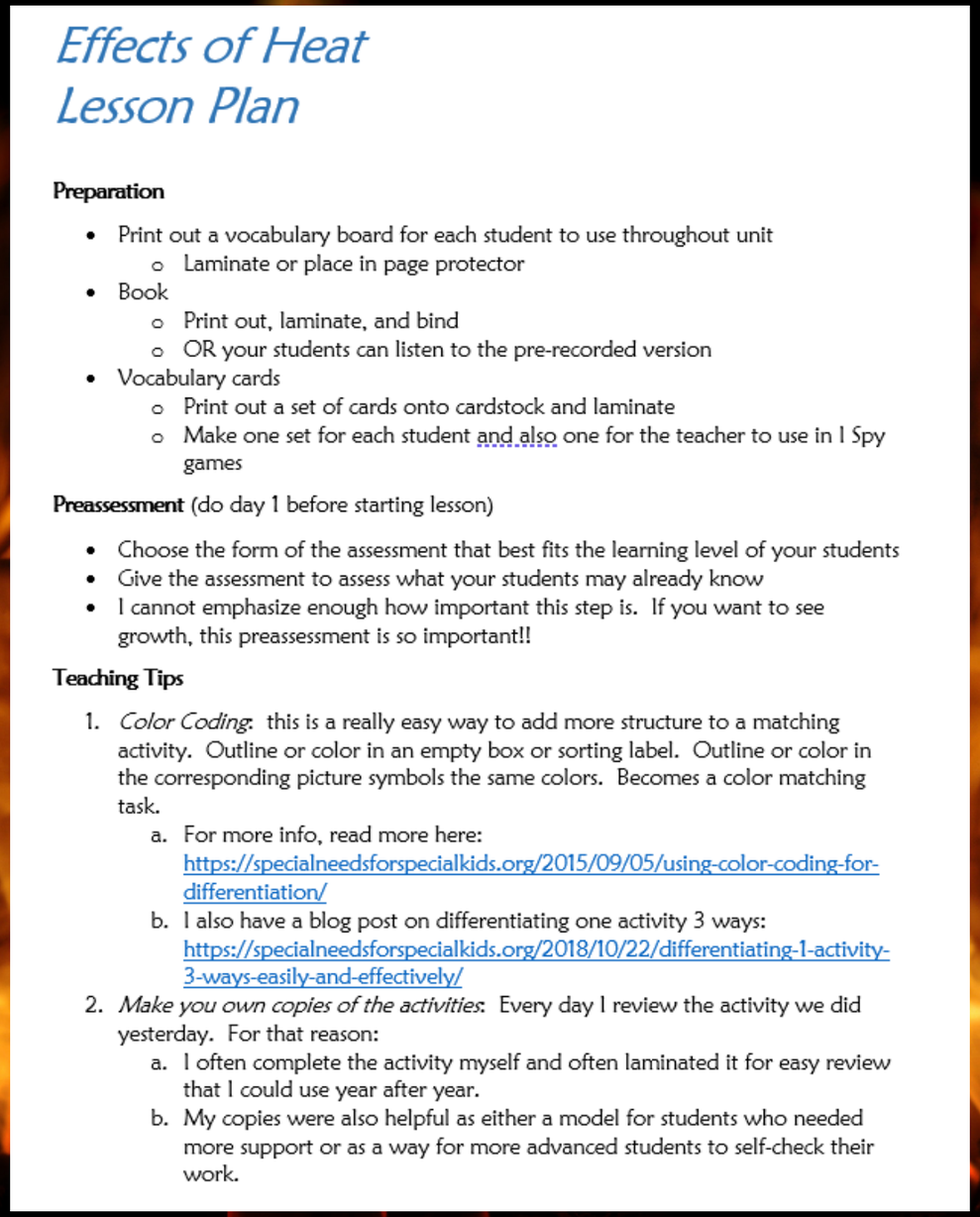
By
Christa Joy
Special Needs for Special Kids

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 ☺

Also included with this unit are detailed lesson plans in a separate file. Let me know in the feedback if this was helpful ☺

This unit contains over 150 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.



Effects of Heat
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)

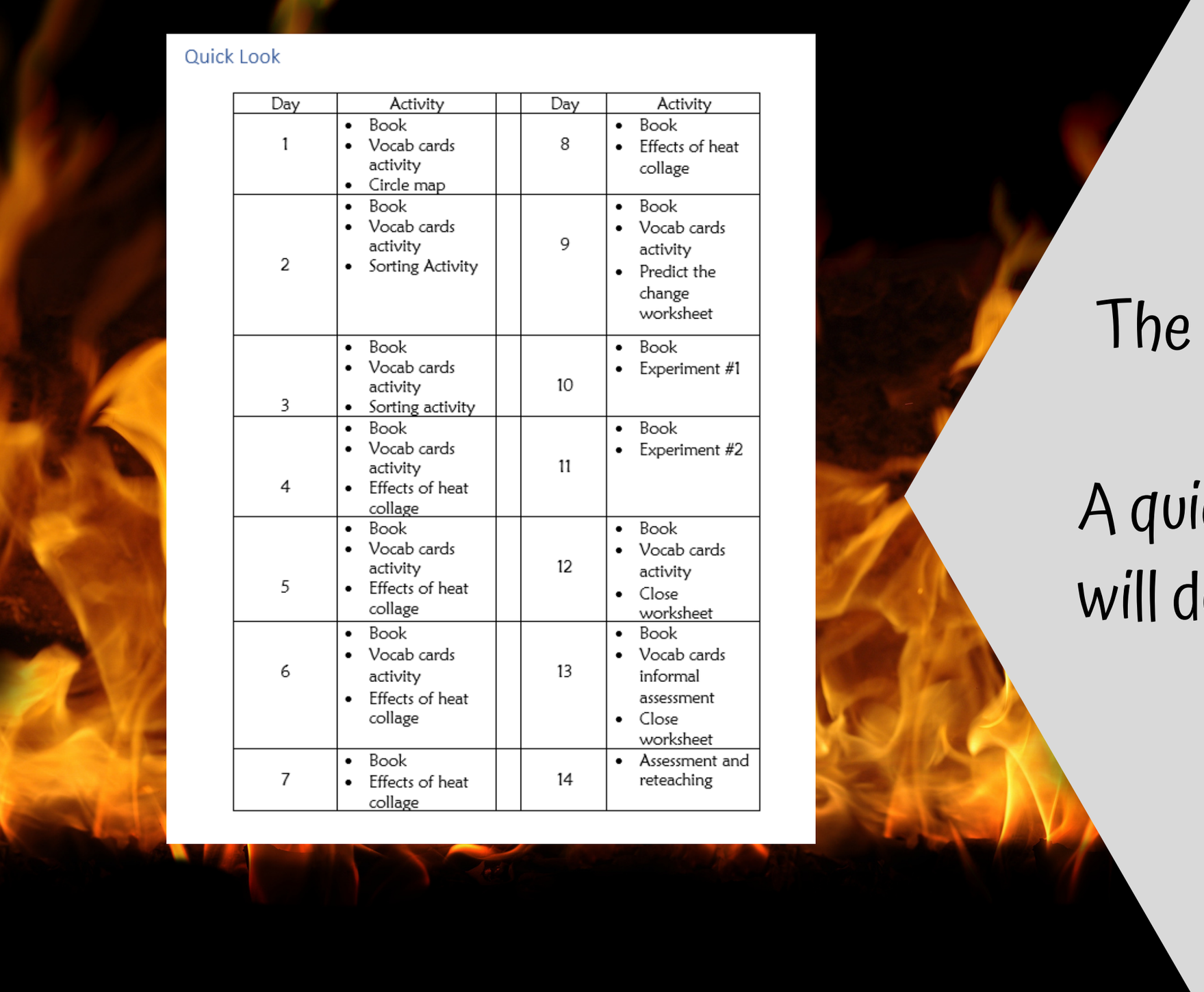
- Choose the form of the assessment that best fits the learning level of your students
- Give the assessment to assess what your students may already know
- I cannot emphasize enough how important this step is. If you want to see growth, this preassessment is so important!!

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 work.

The lesson plans contain:

Overall tips for teaching students with significant needs



Quick Look

Day	Activity		Day	Activity
1	• Book • Vocab cards activity • Circle map		8	• Book • Effects of heat collage
2	• Book • Vocab cards activity • Sorting Activity		9	• Book • Vocab cards activity • Predict the change worksheet
3	• Book • Vocab cards activity • Sorting activity		10	• Book • Experiment #1
4	• Book • Vocab cards activity • Effects of heat collage		11	• Book • Experiment #2
5	• Book • Vocab cards activity • Effects of heat collage		12	• Book • Vocab cards activity • Close worksheet
6	• Book • Vocab cards activity • Effects of heat collage		13	• Book • Vocab cards informal assessment • Close worksheet
7	• Book • Effects of heat collage		14	• Assessment and reteaching

The lesson plans contain:

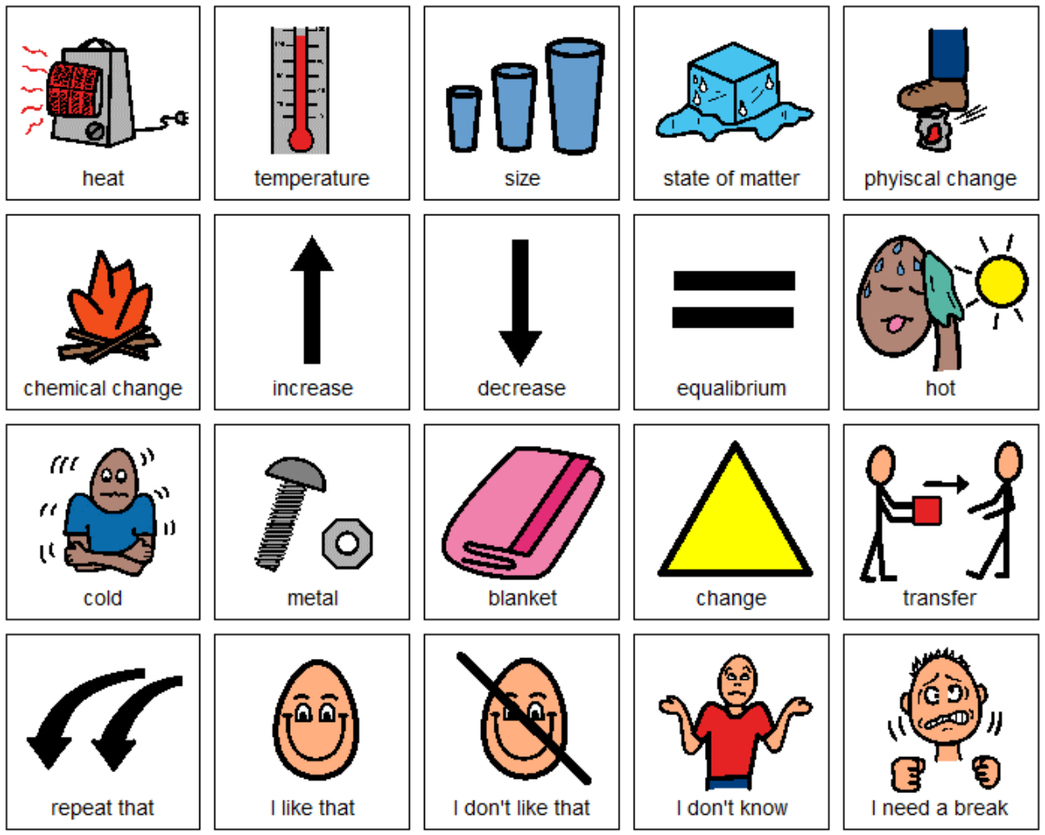
A quick look at what you will do each day

Day 13

Activity	Notes	Materials
Read or listen to a recording of the book (10 minutes)	• Read through the story, asking lots of questions • Continue to make connections between book and vocabulary board	• Book • Vocabulary board
Vocabulary cards informal assessment (15 minutes)	• Do an informal assessment with each student to see how many of the cards they know. • Have them complete the cut and paste activity either using the pictures or definitions depending on their level	• Vocabulary card cut and paste worksheet • Vocabulary board
Review (5 minutes)	• Review the close worksheet from yesterday	• Finished close worksheet
Close Worksheet (10 minutes)	• Complete page 2 close worksheets • Use color coding if needed (see note on page 1 for more information) • This is your first real chance to begin assessing if your students are making connections to the material.	• Book (if needed for students to find answers) • Vocabulary board • Close worksheet • Scissors • Glue
Sharing (10 minutes)	• Each student shares their finished close worksheet	• Completed worksheet • Communication devices
Time to Assess	• At this point, you should have a fairly good idea of how well your students are doing with the material. • What areas do you need to re-teach before moving onto the final assessment? • Consider redoing some of those specific activities. • Do NOT be afraid of repetition. • Move onto the assessment when you feel your students are ready.	

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!!

When we apply heat to any object it causes certain things to happen. Heat causes things to change.

The addition of heat causes 5 main things to happen:

1. It causes an increase in the temperature of the object.
2. It increases the amount of space the object takes up or makes it expand.
3. It can change the state of matter of the object.
4. It can change the physical properties of the object.
5. It can cause a chemical change to occur.

There is a 63 page book with this unit using simple text and photos.

It comes in a pdf version as well as a voice recorded powerpoint (so you don't have to print it out.)

heat

Energy that is transferred from one object to another than can cause the object to change.

physical change

Change in the shape, size or color of an object that does **NOT** change the molecules in the object.

chemical change

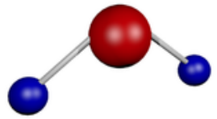
Change that results in a new substance being formed.

physical property

Things that describe how an object looks and feels.

molecules

Make up objects and move faster and farther apart when heat is added.



temperature

How hot or cold something feels. Determined by how fast molecules are moving.

energy

Ability to do work. Heat is a form of energy.

conductivity

How well an object can transfer heat.

There are 12 vocabulary cards that come in color and black and white.

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

heat

Energy that is transferred from one object to another than can cause the object to change.

physical change

Change in the shape, size or color of an object that does **NOT** change the molecules in the object.

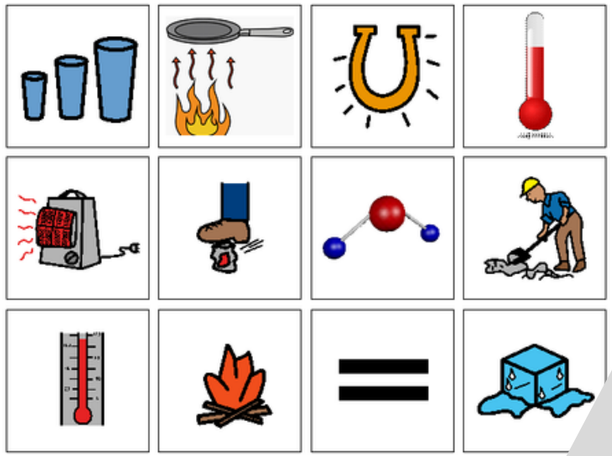
chemical change

Change that results in a new substance being formed.

physical property

Things that describe how an object looks and feels.

Cut apart and match pictures with definition.



equilibrium

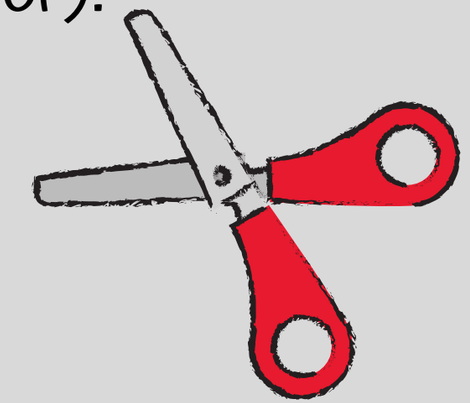
mercury

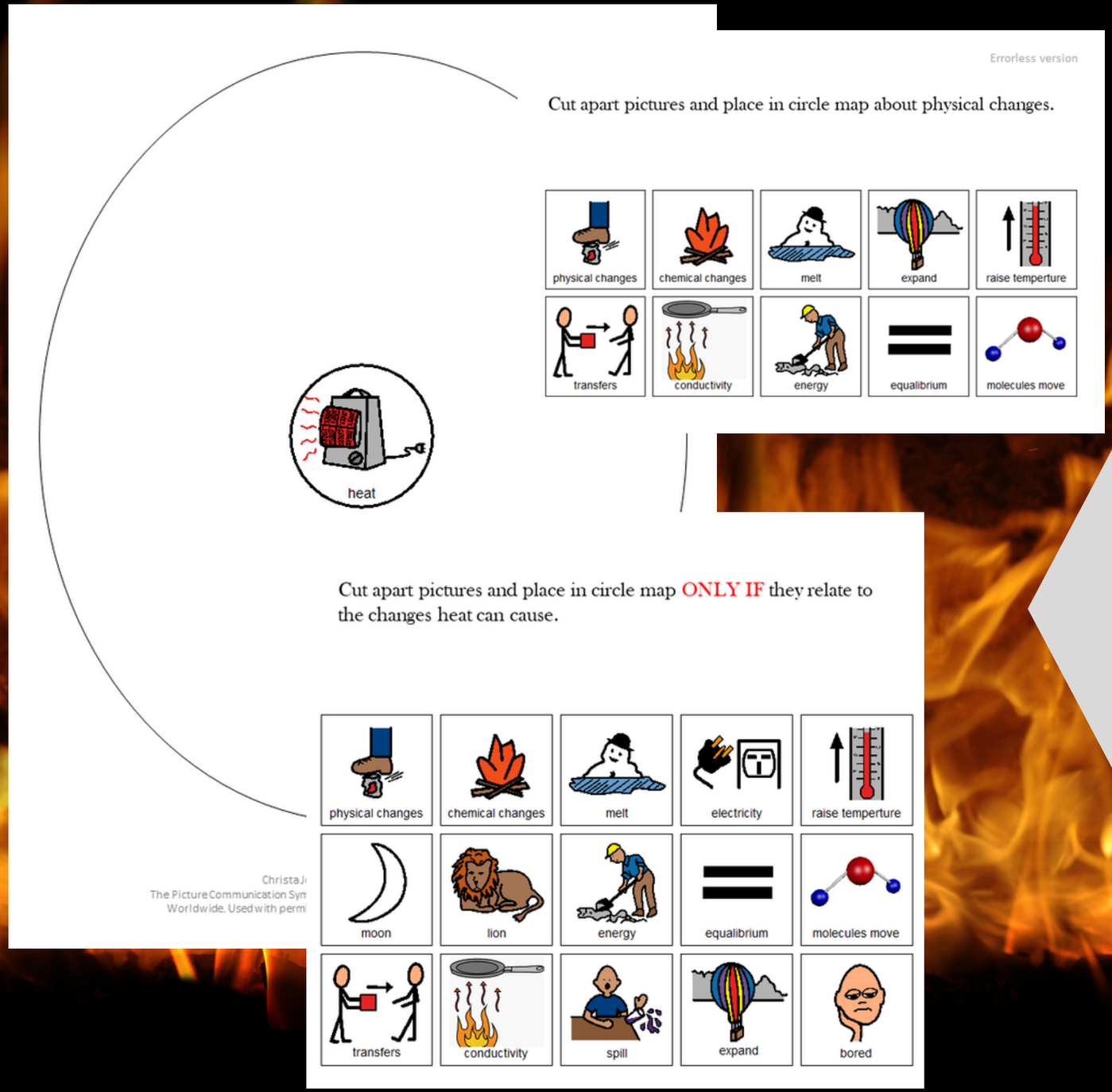
State of matter

blacksmith

An object can be either a solid, a liquid, or a gas.	Make up objects and and farther apart wh added.
Change in the shape, size or color of an object that does **NOT** change the molecules in the object.	The liquid inside a thermo that expands when it gets h
When 2 object that are touching each other are the same temperature.	Energy that is transferred from o object to another than can cause the object to change.
Someone who works with very hot metal, bending it into a new shape.	How hot or cold something feels. Determined by how fast molecules are moving.
Ability to do work. Heat is a form of energy.	Things that describe how an object looks and feels.
Change that results in a new substance being formed.	How well an object can transfer heat.

Towards the unit of the unit, there is an activity where students will match either the picture to the definition or the definition to the picture (harder).

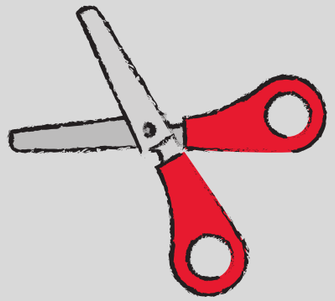


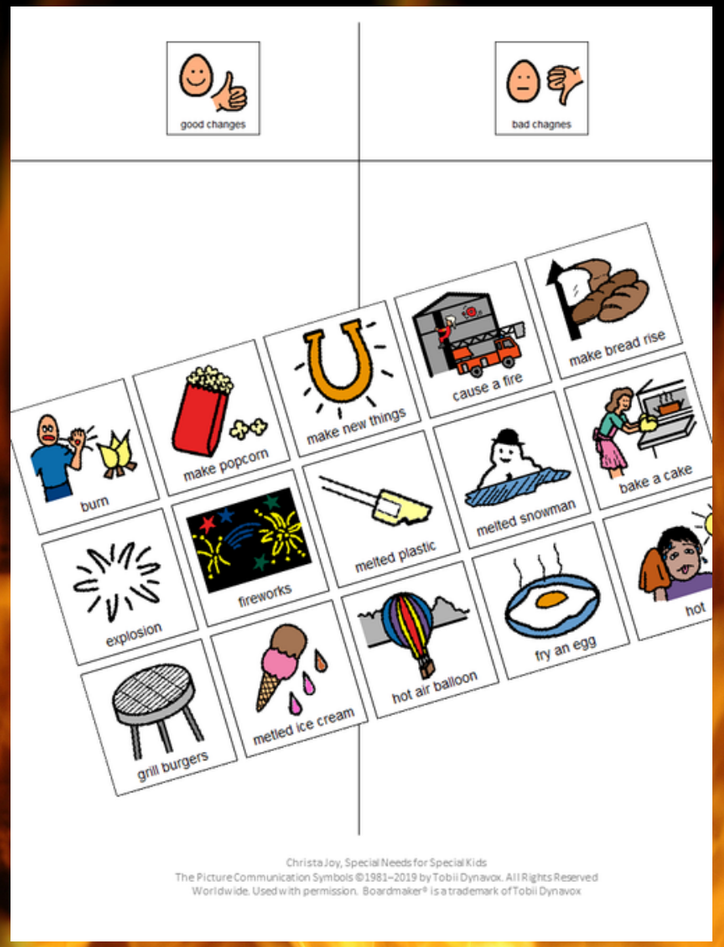


There is a circle map reviewing the main points from the book.

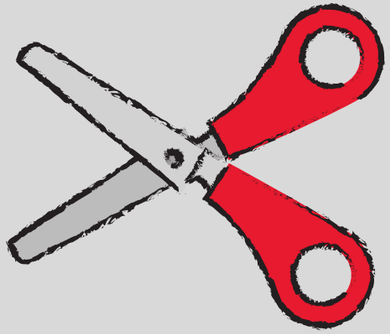
Circle maps are a great way for students to see the concept at a glance. There are 2 versions:

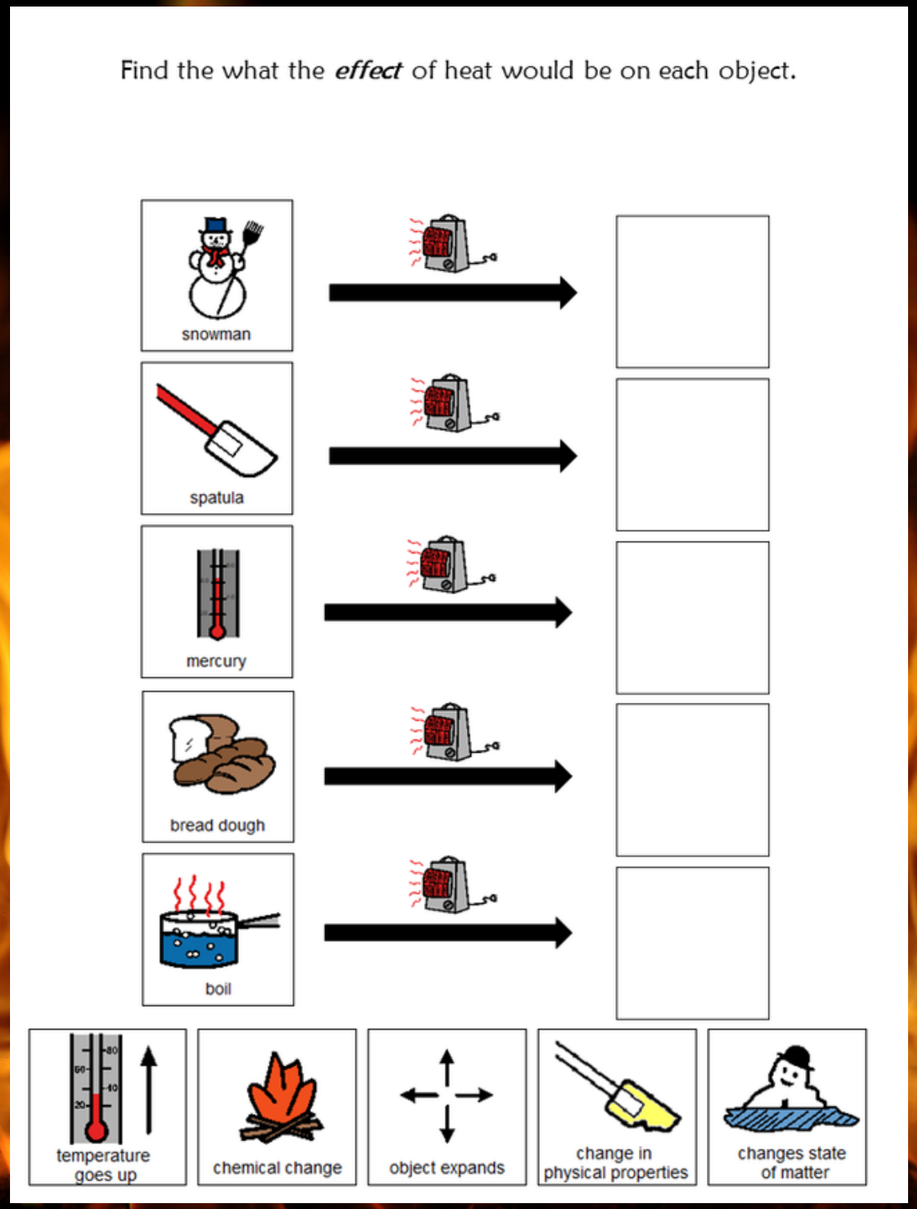
- One is errorless
- One has wrong answers mixed in students will have to set aside



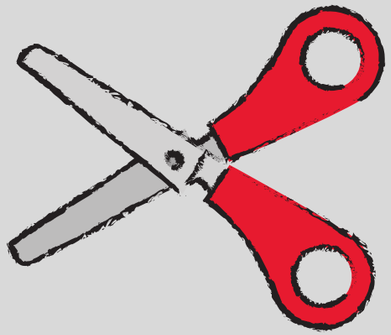


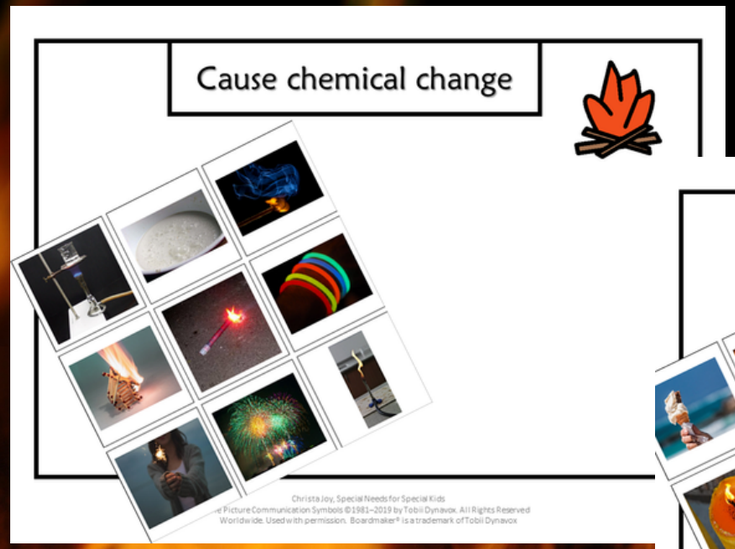
There are 2 sorting activities looking at the good and bad effects of heat as well as things that are good and bad conductors. Suggestions for differentiation are included.

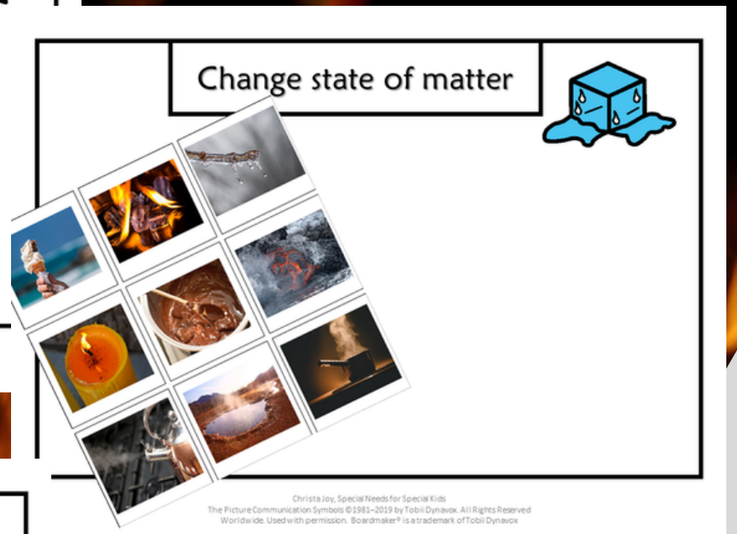


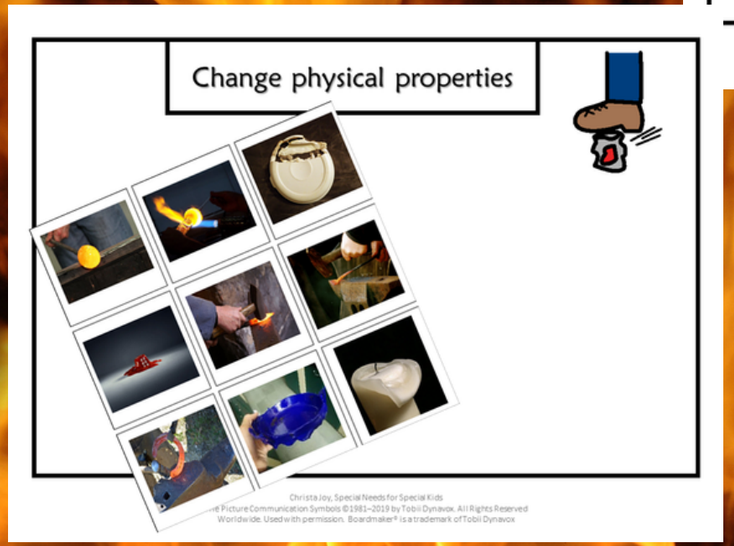


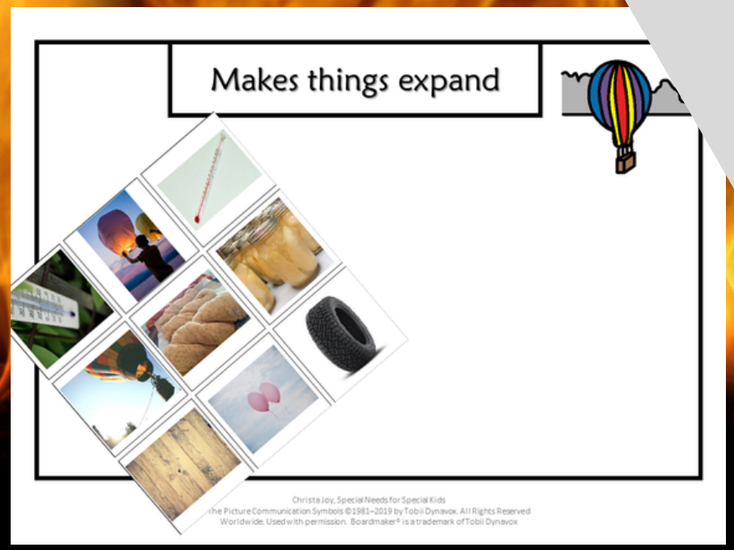
There is a matching activity looking at the specific effects of heat on an object.



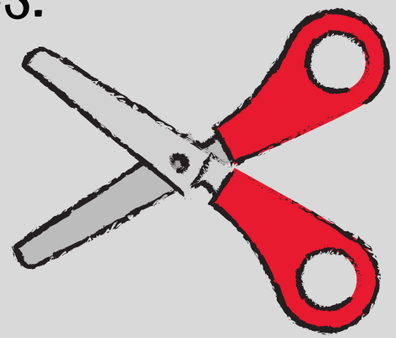


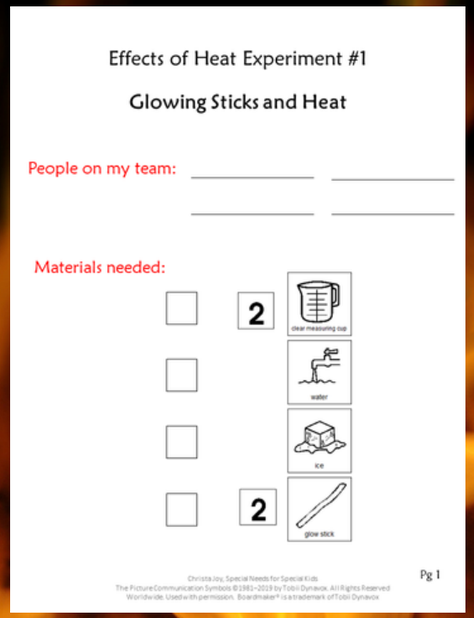






There are 5 collages students can create showing the various effects of heat. These are errorless tasks and make great review sheets.




Effects of Heat Experiment #1

Glowing Sticks and Heat

People on my team: _____ _____

_____ _____

Materials needed:

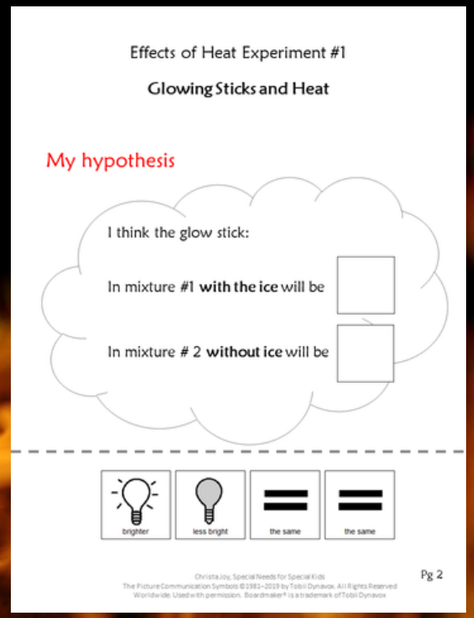
☐ 2 clear measuring cup

☐ water

☐ ice

☐ 2 glow stick

Pg 1


Effects of Heat Experiment #1

Glowing Sticks and Heat

My hypothesis

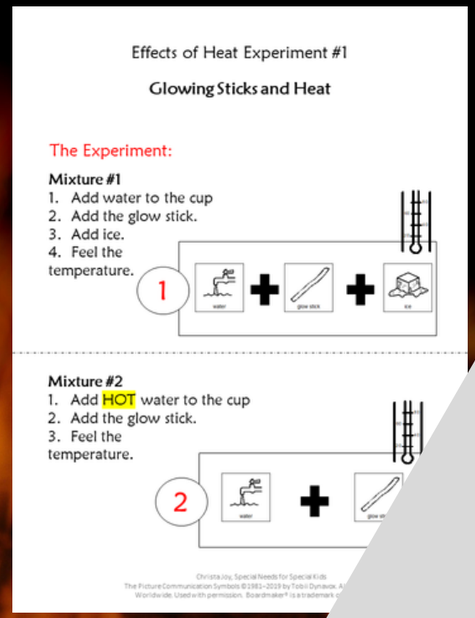
I think the glow stick:

In mixture #1 **with the ice** will be ☐

In mixture # 2 **without ice** will be ☐

brighter | less bright | the same | the same

Pg 2


Effects of Heat Experiment #1

Glowing Sticks and Heat

The Experiment:

Mixture #1

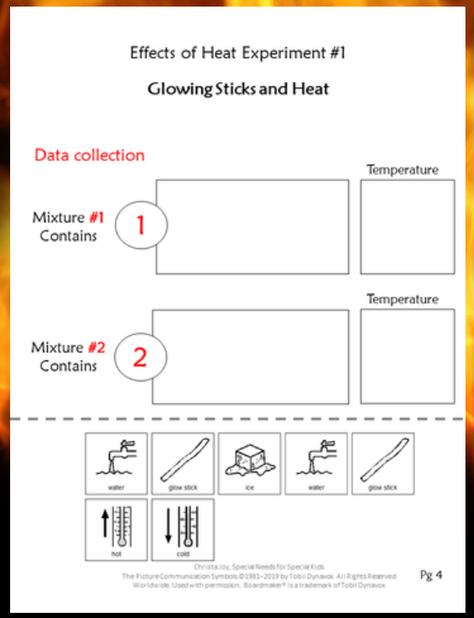
1. Add water to the cup
2. Add the glow stick.
3. Add ice.
4. Feel the temperature.

1 water + glow stick + ice

Mixture #2

1. Add HOT water to the cup
2. Add the glow stick.
3. Feel the temperature.

2 water + glow stick


Effects of Heat Experiment #1

Glowing Sticks and Heat

Data collection

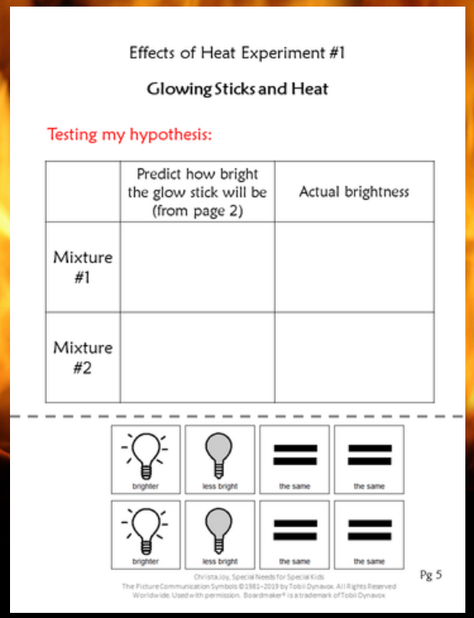
Mixture #1 Contains 1 ☐ Temperature ☐

Mixture #2 Contains 2 ☐ Temperature ☐

water | glow stick | ice | water | glow stick

hot | cold

Pg 4


Effects of Heat Experiment #1

Glowing Sticks and Heat

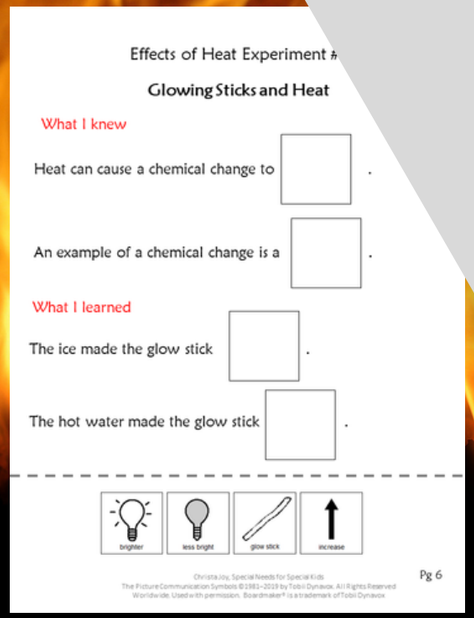
Testing my hypothesis:

	Predict how bright the glow stick will be (from page 2)	Actual brightness
Mixture #1		
Mixture #2		

brighter | less bright | the same | the same

brighter | less bright | the same | the same

Pg 5


Effects of Heat Experiment #

Glowing Sticks and Heat

What I knew

Heat can cause a chemical change to ☐ .

An example of a chemical change is a ☐ .

What I learned

The ice made the glow stick ☐ .

The hot water made the glow stick ☐ .

brighter | less bright | glow stick | increase

Pg 6

There are 2 experiments included in this unit. There are detailed instructions as well as pages for students to fill out, leading them step by step through the scientific method.

Effects of Heat

1. Heat can [ ] an object.

2. When you apply heat to an object, it [ ] the temperature.

3. Some objects heat up faster than others. Those that heat up faster and easier are good [ ].

4. [ ] is an example of a good conductor.

5. When two objects touch each other, they transfer heat until they both have [ ] temperature.

Effects of Heat

6. Heat can cause an object to get bigger, or [ ].

7. Mercury will go [ ] the thermometer as it gets

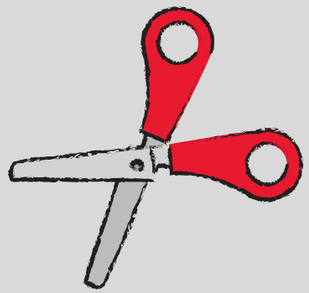
8. Heat can also change the state of matter, making [ ] tu into steam.

9. Heat can also speed up or cause [ ] reactions to occur.

10. Heat is really just a form of [ ].

Close worksheets are a great informal assessment. This unit has 10 questions that review thermal energy.

Answer key included.



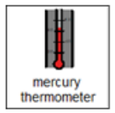
Version 1

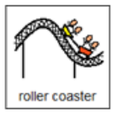
1. Heat is a form of energy that can do what to an object?

2. Things that transfer heat well are called good:

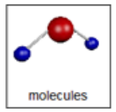
3. Ice melting in a glass of lemonade is an example of:

4. Heat can cause things to expand. An example of this is:





5. Objects expand because these start moving faster and can move away from each other easier.



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

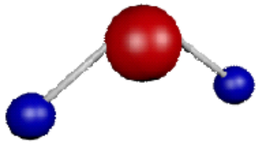
Answer key included.

Version 2

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

Q 5

feathers



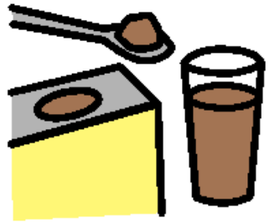
grilling

clouds

Q 6

fireworks

breaking a stick



mixing chocolate milk

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.

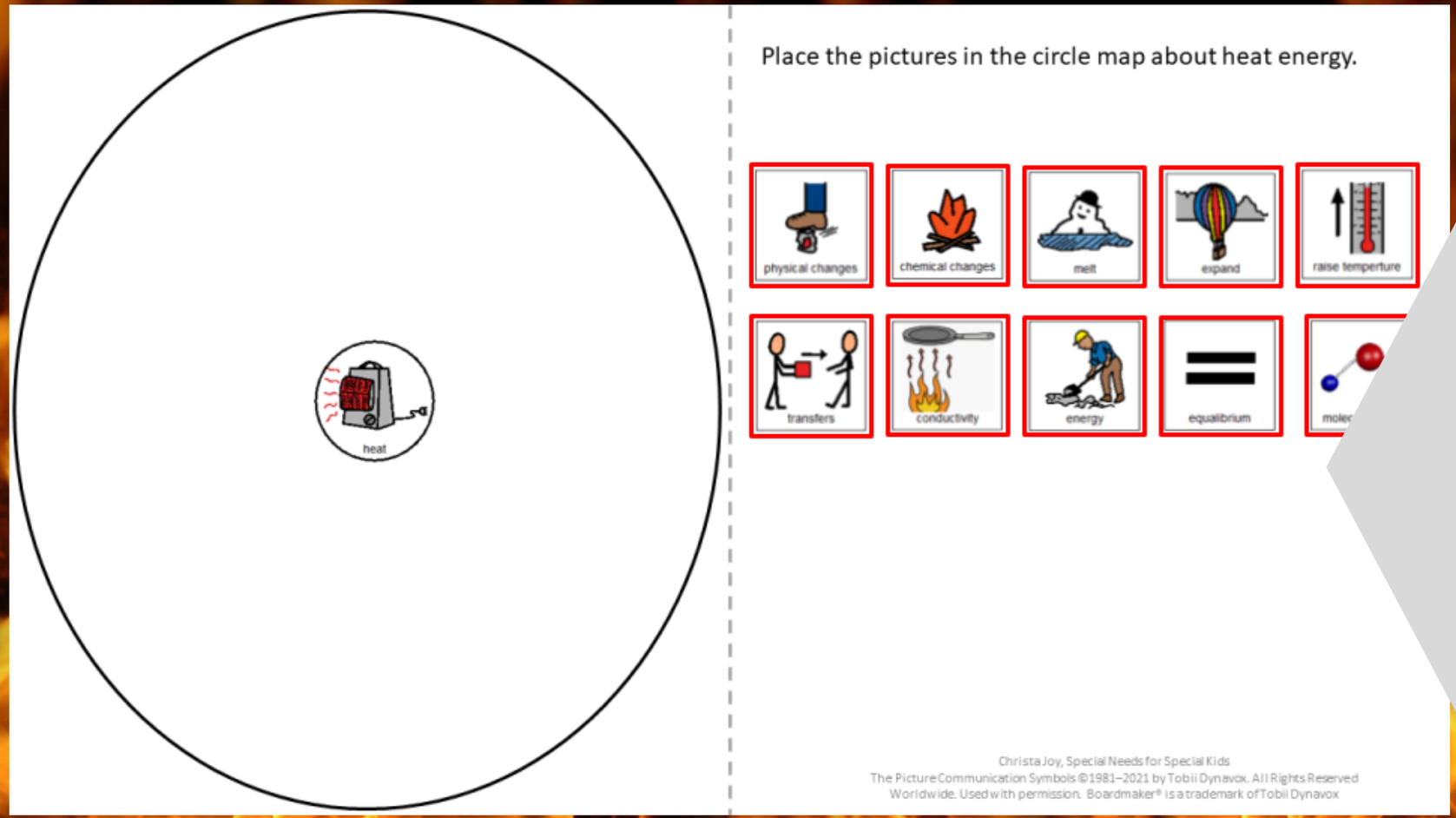
Version 3

1. Heat is a form of energy that can do what to an object?
   A. Change
   B. Freeze
   C. Spill
2. Things that transfer heat well are called good:
   A. Tools
   B. Conductors
   C. Lawn mowers
3. Ice melting in a glass of lemonade is an example of:
   A. Mixing
   B. Grilling
   C. Equilibrium
4. Heat can cause things to expand. An example of this is:
   A. Mercury thermometer
   B. Roller coaster
   C. Hot chocolate
5. Objects expand because these start moving faster and can move away from each other easier.
   A. Feathers
   B. Molecules
   C. Clouds
6. Heat can cause a change in the state of matter of an object. An example of this is when:
   A. Break an egg
   B. Light a match
   C. Snowman melts

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 Heat Energy.

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



The digital activities have students click and drag their answers.

Sort pictures into correct column depending on if you think that are a good or bad conductor from heat. If you are not sure, place it on the middle line.

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

Effects of Heat Experiment #2

Expanding a Liquid

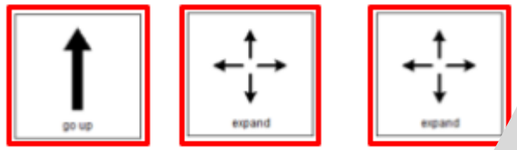
What I knew

Heat can cause an object to [ ] .

What I learned

The hot water caused the liquid in the straw to [ ] as it [ ] .

Choose from the pictures below to complete each sentence about what you saw and learned.



There are also slides with the experiments laid out and ways for students to record their observations.

Click Here to read more!!

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 books and fact sheet) come in color and black and white.