

General Information

Lesson Parts & Duration

Total Duration: 1 to 1 1/2 hours

- Synthesize Text: Cause & Effect, Key Details, Summarizing
- Geometry and Science

Subject(s)

- Informational Text: "Thermal Expansion" by Janna Duffy
- Synthesize Text and Key Details, Cause & Effect, Vocabulary, and Summarizing (R.I. 4.1-4.4)

Objective

- <u>Students will</u> identify cause and effect relationships using key details from the text.
- <u>Students will</u> to write a summary of the informational text.
- <u>Students will</u> create a visual comparison of glaciers and ice cubes.

Materials

- Required: copies of Informational Text, (page 5), or display on a document camera (optional)
- lined pieces of paper
- pencil and crayons (markers or colored pencils)
- document camera or similar device to share with class
- **Required:** copies of Drawing cube activity (page 6) or display a copy on a document camera
- **Optional:** printable "Break Up Your Day" brain/movement break ideas (page 8)

Protocols (on page 7)

- Used throughout lesson be familiar with each protocol.
- Place Protocols under a document camera (if available) as necessary throughout the lesson.

Throughout this lesson, you will find:

- Scripted Text indicates things that need to be said directly. Bullets starting with a "T" followed by *italicized type* indicate scripted text
- Clarifiers within scripted text are in orange
- Teacher Directions indicate things you should be doing
- * Side notes provide helpful hints, ELL strategies, differentiation and information
- Break Up Your Day (Brain/Movement Breaks) are in green boxes (at the end)

Remember!

Quality over quantity. All components do not have to be accomplished; lessons may be ended at any time and resumed later.

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ELA



Distribute Text: "Thermal Expansion"

Introduction

- **T** You are going to read "Thermal Expansion" like a scientist and find cause and effect relationships.
- Scientists are always considering cause & effect Τ relationships.
- **T** The cause is telling the "why" or "what made something happen" and the effect is telling "the result" or "what actually happened".
- Please read "Thermal Expansion" independently. Τ

Give time to complete this task. Monitor students and provide assistance as needed.

- *T* What is causing the icebergs to melt?
- Τ Now you will reread "Thermal Expansion" with a buddy.
- *T* I would like you to take turns and alternate sentences.

Give time to complete this task. Monitor students and provide assistance as needed.

Create and display "Cause and Effect" organizer on document camera Sample Cause and Effect Graphic Organizer found on the right.

Pass out 1 piece of paper per student.

- **T** You are going to recreate this graphic organizer on your paper.
- *T* Once you have created your graphic organizer see if you can find one cause and effect relationship.

Ask, Answer, and Justifu (students take Text and their cause & effect araphic organizer/pencil)

 Ask, Answer, dird Jostry Put students in pairs: have them assign themselves a number 1 or 2 Roles for number assignments: 1's will ask the question first and 2's will respond Then 2's will ask the question and 1's will respond 	 Give one & Get one Students share information in Ask & Justify Each student in the pair writes down the information shared by their partner If the information is already written, a check is put by the information

- T Now with your partner you are going to first Ask, Answer, and Justify and then Give one & Get one
- T This will help you to add details to your cause and effect graphic organizer.
- Complete your Cause and Effect Graphic Organizers with your partners using "Thermal Expansion". T Example: Cause: object changes temperature; Effect: the object expands or contracts

Give time to complete this task. Monitor students and provide assistance as needed.

T Please return to your original seats.



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Pass out 1 piece of lined paper per student.

Writing a Summary

- *T* On your paper write, "I will organize key details to prove a theme for the text."
- *T* You will write 5 to 7 sentences summarizing the informational text.
- **T** You may use your informational text and your Cause and Effect Graphic Organizer.
- *T* Make sure that you edit your work.
- *T* You should be focusing on your spelling mistakes, punctuation marks, and that your ideas make sense.
- *T* There are several things you need to make sure you do when writing your summary.
- *T* Indent the first line.
- T Use complete sentences.
- *T* Use transition words.
- T Use details from the text and place the exact words from the text in quotes.
- *T* And last, be sure you finished with a concluding sentence.
- *T* You should be focusing on your spelling mistakes, punctuation marks, that your ideas make sense.
- *T* Once you have finished I will let you read your summary with either a buddy or the whole class.

Students share their sentences as the writing process continues.

Checklist for TEACHERS

- I indented the first line only
- I started with a topic sentence (example: "The informational text explains that icebergs melt in the water due to thermal expansion.)
- I used complete sentences
- I used transition words (first, next, then, last)
- I used details from the text and placed the exact words from the text within

QUOTES (example: The author states that thermal expansion "explains how matter changes" which demonstrates how glaciers and icebergs melt.)

• I finished with a concluding sentence (example: The informational text demonstrates that glaciers, icebergs and ice cubes use the physical property of thermal expansion.) Checklist for Students

- I indented the first line
 only
- I started with a topic sentence
- I used complete
 sentences
- I used transition words
- I used details from the text and placed the
- exact words from the text within quotes I finished with a
- concluding sentence

🐙 Make sure to "Break Up Your Day!" 🐫

Now is a great time to take a break and get students re-energized. See our list of engaging movement and brain break ideas to get your students moving and ready to refocus! (see page 8)



"Geometry and Science Drawing a Cube activity

Pass out 1 piece of lined paper per student. If you printed the handout on page 6 for students, pass that out as well.

- *T* We have been talking about glaciers today.
- *T* What geometric solid or three-dimensional shape do you think of when you think of ice.
- *T* Hint the answer is in a phrase we use to call ice.
- *T* I may put an ice _____ in my drink.
- T Who knows what shape I am referring to? Call on students. Answer: cube
- *T* I am going to show you how to draw a cube today.
- T On your piece of paper, first draw a square. Model this on either the board or a document camera for students to follow. Give time for students to complete this step. Monitor and provide assistance as needed.
- T Next draw one line at a 45-degree angle, about the same length as one side of the square. Model this on either the board or a document camera for students to follow. Give time for students to complete this step. Monitor and provide assistance as needed.





the ice cube and the sidewalk. Think like a scientist!

T After that we will draw 2 more lines that are parallel, or run side by side, to the first 45-degree line. Model this on either the board or a document camera for students to follow. Give time for students to complete this step. Monitor and provide assistance as needed.

- T Last, connect the 45 degree lines so that new lines are parallel to your original square. Model this on either the board or a document camera for students to follow. Give time for students to complete this step. Monitor and provide assistance as needed.
- *T* Now, let's think like a scientist!
- *T* What happens to an ice cube on a warm sidewalk?
- *T* Now consider how the role of glaciers in the world is similar to that of the ice cube and the sidewalk.
- *T* Turn and discuss your thoughts with a partner.

Give time to complete this task. Monitor students and provide assistance as needed.

T Let's share what you and your partner discussed. Call on students to share their ideas. Annotate their ideas on the board as they share.

🐺 Make sure to "Break Up Your Day!" 🗦

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Thermal Expansion

(1) Have you ever seen an ice cube melt? Scientists can explain this everyday occurrence through the physics of thermal expansion.

(2) When an object changes temperature it expands, contracts, and can even change state. When you see an ice cube melt, it is warming and its state is changing from a solid to a liquid.

(3) Thermal expansion is a physical property that explains how matter changes in shape, area, and volume when its temperature is changed.

(4) If ice is exposed to heat, like sunlight or warm water, then thermal expansion will take place.

(5) Large sheets of ice cover the northern and southern poles of the Earth. When sunlight warms their surfaces, the ice melts from the top. If the ice reaches a warmer part of the ocean, the ice melts also from the bottom.

(5) What happens to an ice cube on a warm sidewalk? What is happening to glaciers? Consider how the role of glaciers in the world is similar to that of the ice cube and the sidewalk. Think like a scientist!





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Ask, Answer, and Justify

- Put students in pairs: have them assign themselves a number 1 or 2
- Roles for number assignments:
 - 1's will ask the question first and 2's will respond
 - Then 2's will ask the question and 1's will respond
 - The next time 2's ask the question first

On your feet/ Get ready to meet/ Go and Greet (should take less than one minute)

- Students stand up and put their hand up in the air
- Students find another student that has their hand up to have a "new" partner (and get them moving around)
- Once they are with their new partner, they put their hands down and face the teacher

Give one & Get one

- Students share information in Ask & Justify
- Each student in the pair writes down the information shared by their partner
- If the information is already written, a check is put by the information

Back to Back and Face to Face

- When in pairs, direct students to stand back to back
- Ask the students to consider the question
- Give students at least a minute to consider their response
- Have them turn face to face
- Follow the protocol for Ask and Justify

Share out and check for understanding

- Follow the protocol for Ask and Justify
- Ask students to share their response to the question
- Verify that response or conclusion is correct
- If needed, provide clarification

(Used throughout lesson - be familiar with each protocol.)

Note: Place Protocols under a document camera (if available) as necessary throughout the lessons



Make sure to "Break Up Your Day!"

These can be used in the middle of a lesson or at the end of your lesson. Here are a few engaging movement and brain break ideas to get your students moving and ready to refocus!

🐺 Break Up Your Day: <u>Thumbs Up!</u> 😽

- Student is called on (use name cards or equity cards if available) to state a quality they see in themselves (kindness, honesty, hard work, humor).
- Other students signify whether they see that quality in themselves.
- Tally their responses.
- The quality with the most votes or Thumbs Up is the theme for the classroom!

🐨 Break Up Your Day: <u>Be a Scientist!</u> 豜

- A scientist separates fact from fiction or fact from opinion.
- Listen to these 3 statements: #1Today is a school day. #2 It is a good day to be a scientist. #3 We live on the planet Earth.
- Students show teacher which statement is an opinion (answer: #2).
- Now, turn to your buddy and create 3 facts or opinions. See if your buddy can be a scientist!
- Monitor student statements.
- Round 2 of "Be a Scientist" can include facts or opinions from the texts.