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## Bookmaking: Extreme Weather Science



It is assumed that most writing will take place in the classroom during content instruction time. Lesson times are suggested and can be adjusted to fit classroom schedules. Paste paper, an ancient book over art form, is an independent lesson and an optional component of this project.

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# Bookmaking: Extreme Weather Science

sidexside

## UNIT OVERVIEW

Through classroom research, scientific writing, illustration, and bookmaking, students will study the causes and effects of extreme weather and share their knowledge in a handmade book.

## BIG IDEA

Book design and illustration can help us better understand and demonstrate scientific concepts.

## LEARNING GOALS

*Students will understand:*

- How to think like an artist/scientist with curiosity, experimentation, and evaluation.
- How art and science provide processes for discovering and demonstrating knowledge.
- How to research and present knowledge to peers and community.
- How methods of bookmaking enhance non-fiction reading.
- The importance of revising work in both art and writing.
- How creative bookmaking can showcase visual knowledge, nonfiction writing, and scientific data of extreme weather.

**GRADE LEVEL:** Fourth Grade

**ART FORM:** Mixed Media Bookmaking and Illustration

**INTEGRATED SUBJECTS:** Life Science and Literacy

## Project Kick-off:

The project will begin with a visit from a weather expert. Students will watch a presentation about how and why weather is identified and recorded. They will learn interesting facts about their local weather and causes of extreme weather conditions around the globe. Students will explore scientific books about extreme weather events and choose one particular type of extreme weather to be the focus of their research. Timeframe: 1 hour

## Optional Lesson: Paste Paper

Students will learn how to make paste paper covers for their books using color and texture appropriate to their research topic : 1 hour

## Lesson 1: Accordion Book Form

Students will learn how to fold paper to make the book structure. Using drawing, cut paper, and collage techniques, students will begin to create a cover and title for their book: 1.5 hours

*continued...*

## Teaching Tips:

- Contact your local news station or NOAA office and ask about educational outreach.
- Pre-teach the content so students are familiar, or even experts, when they start to create.
- Give each student one large manilla envelope to keep any support materials, handouts, scraps of their paste paper, drawings, and writings in throughout the project.
- Have students design a rubric or [checklist](#) for the project. What do you want to learn?
- End each lesson with a reflection (wrap up) such as “rose and thorn” and describe next lesson.



## Lesson 2: Pop-Ups, Drawings, and Flaps

Students will learn about book design and layout to support their writing. They will learn to create pop-up sections, flaps and pockets to hold additional drawings, and written information on the book pages: 2 hours

## Lesson 3: About the Author

Students will add a final page about the author, learning to write biographically: 1 hour

## Lesson 4: Building the Book

Students will paste writings and all drawings/illustrations into the book, finishing up any remaining pieces: 1.5 hours

## Celebration of Learning

Students will teach their peers and community about extreme weather using their books as a visual aid and providing an interactive gallery walk or presentation: 45 min–1 hour

### **SEL LESSON CONNECTIONS**

Side x Side's model of arts integration authentically aligns with Social Emotional Learning benchmarks through three primary developmental areas: self-management, self-expression, and relationship skills. During this arts integrated unit, students have a range of opportunities to notice and learn about themselves in new ways. Many project components involve communication and collaboration, developing a broader sense of social awareness and forging deeper relationships. Students gain valuable flexible and varied skills when approaching a core subject in a creative way. We strive to incorporate communication and community building skills in everything we do. We use group reflection or wrap-ups at the end of each lesson to cement learning and foster continued curiosity.

Most classrooms have students with varying learning strengths. This unit includes opportunities to strengthen fine motor skills, follow multi-step directions, practice new and core vocabulary terms, and work collaboratively with peers. Please note, the lesson plan can be adapted in multiple ways and tips for differentiating the lesson are given throughout.



## OPTIONAL LESSON: Paste Paper

### MATERIALS

#### Per student:

- smocks
- foam brushes
- pencils
- paper: large, heavy-duty card stock or poster paper in a variety of colors

#### To share:

- exemplar paste papers
- newspapers/tablecloths
- containers for water
- texture tools
- spray bottles of water
- sponges
- paste in a variety of colors

### VOCABULARY

texture, line, pattern, movement, speed, action, color

### LEARNING GOALS

*Students will understand:*

- How to use a variety of different marks, textures, colors, and gestures to express attributes of extreme weather.
- How to mix and apply colors to represent their weather type.
- How scientific information can be expressed visually.
- The importance of sequence and steps.

### Timeframe: 1 hour

Students will learn how to make paste paper covers for their books using color and texture appropriate to their research topic.

### Set Up:

Make Paste Paper using this online tutorial by a Side x Side teaching artist:

- [https://sidexsideme.com/video\\_tutorial/video-tutorial-paste-paper/](https://sidexsideme.com/video_tutorial/video-tutorial-paste-paper/)

*Prepare the classroom...*

- Cover tables with newspaper or tablecloths.
- Make smocks available.
- Fill containers of water to dip brushes.
- Fill paint containers.

## INSTRUCTIONS

### Step 1: Introduction

Describe the history of paste paper and show examples. Demonstrate paste paper technique using texture, mixing colors, and creating movement.

### Step 2: Painting

Begin by making sure each student writes their name on the back of their paper. Next, wet the paper with a spray bottle and spread the water with your hands. Use a sponge to mop up any excess water. *\*Make sure the paper isn't too wet.*

Paint one color onto the whole page, using broad strokes to go back and forth. Make sure you cover the whole page, and work quickly so the paint does not dry.

### Teaching Tip:

Have paste paper paint mixed in small containers ahead of time.

**SEL SKILL:  
SELF-MANAGEMENT**

is the ability to regulate one's emotions, thoughts, and behaviors effectively in different situations. Making large-scale paintings requires careful listening, body control, and impulse management. Students can link content and self-expression through color and texture using paint, crayons, and salt.



## Step 2: Texture Tools

Using texture tools (combs, forks, brush handle, etc.), create designs in the paint.

## Step 3: Accent Color

Add a second color, but only use a little as an accent color. Use small dots of paint or lines of paint on the paper.

*\*Make sure not to paint over all the design work already complete.*

## Step 4: Texture Tools II

Use texture tools again to create more designs and patterns.



### Teaching Tips:

- When the paste paper has dried, cut it to the size of the accordion books, being careful not to cut off students' names. Save the scraps for collage in the large envelopes.
- Have papers organized by color and discuss how colors can support weather information.

### Extra Time?

- Have students make additional paste paper for students that are absent.
- Write a story about extreme weather they have experienced.
- Provide a table with drawing paper and pencils for early finishers.

## LESSON 1: Accordion Book Form

**MATERIALS****Per student:**

- pre-cut colored paper for folding pages
- several pieces of pre-cut card stock for title
- pencils and erasers

**To share:**

- exemplars of collaged and cut paper covers
- collage materials: colored paper scraps
- bone folders (several rulers)
- scissors
- permanent markers
- colored markers or colored pencils
- artist paste or glue (small containers with brushes or popsicle sticks)
- various cut ribbons
- newspaper/tablecloths for tables

**VOCABULARY**

drawing, illustration, crease, hinge, flush, scientific data, air pressure, precipitation, force

**LEARNING GOALS:**

*Students will understand:*

- The importance of following step by step instructions.
- How to create drawings and illustrations that reveal understanding of a scientific concept.
- How a title page informs the reader.
- How peer feedback can help us refine a message.

**Teaching Tip:** Make sure students gather their materials and keep them together in their large envelope.

**Timeframe: 1.5 hours**

Students will learn how to fold paper to make the book structure. Using drawing, cut paper, and collage techniques, students will begin to create a cover and title for their book.

**INSTRUCTIONS**

## Step 1: Introduction

Show students an exemplar and explain where the information and drawings will go in the book. Share resources on extreme weather and on collage and illustration (to be made available throughout the project). Make connections between how a scientist shows information and how an artist shows information.

## Step 2: Fold Accordion Pages

Choose a color of pre-cut, rectangular, heavy-duty paper. Turn the paper to a vertical orientation and fold the paper in half. Then fold each half to meet in the middle. Next, re-fold the center fold so the book makes an M or W-shaped accordion. There should be four panels in the book. Demonstrate how to use the bone folders to crease pages. Be sure each student writes their name in a lower corner of their folded book.

## Optional Step: Paste Paper Covers

Have students cut their paste paper to fit their accordion books and glue (using paste) on the outside to form a cover. Be sure the cover is  $\frac{1}{4}$  inch bigger than the folded pages. Let this dry while students work on titles and illustrations.

## Step 3: Drawing vs. Illustration

Discuss the difference between drawing and illustration and how both will support their scientific writing. Have students think about their topic and look at resources, highlighting illustrations that support the text. Demonstrate how to illustrate a component from their writing (warning signs, causes of extreme weather, safety). Demonstrate how to draw additional components (an evacuation route, preventative measure, or landscape) showing dimension. Encourage careful work and

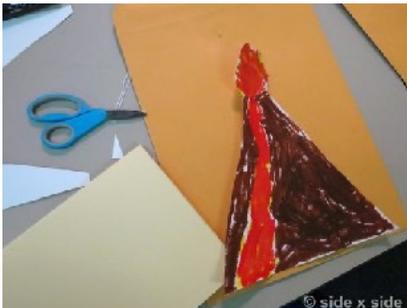
## SEL SKILL: SELF-AWARENESS

is the ability to accurately recognize one's emotions and thoughts and their influence on behavior. Bookmaking requires planning, organizing, and understanding one's strengths. Setting goals while blending content with drawing and design builds content knowledge and self-confidence.



### Teaching Tip:

Watercolors can be used instead of colored pencils and markers.



### Teaching Tip:

Have a word bank available for weather terminology.



### Fun Fact:

The first printed books didn't have the name of the author or even the title printed on the covers. The covers were artworks, covered in drawings, leather, or even gold!

experimentation. For example: a picture of a tornado can support writing about how wind forms into a tunnel. How many ways can you draw or use collage material to make a tornado? Let the students know they will have more than one class period to work on drawings/illustrations and collage work.

## Step 4: Cover Image

Using card stock or heavy drawing paper, demonstrate how to create a drawing with the option of collage for the cover. Show them how they will cut around the edge of the image when they are done and paste it on the cover with the title. Instruct students to find a peer and ask for feedback when they feel they are close to done. When students have completed their cover image, including any corrections, they can trace over the pencil with a permanent marker and use colored pencils or markers to color it.

## Step 5: Book Title

Using pre-cut card stock, have students create a title for their book. Give examples of titles that are descriptive and informative. Have them write their title in pencil, then trace over with permanent marker.

## Step 6: Cut & Glue

Have students carefully cut out their cover drawings. Store any additional drawings in their project envelope. Demonstrate how to use the paste to glue the title and drawing/illustration on the cover page.

### Extra Time?

- Provide a table with drawing paper and pencils for early finishers to draw landscapes where their extreme weather occurs.
- Some students may need to catch up on writing. Have students' work available.
- Students can create an index or glossary of extreme weather terms.

### Next steps:

- Discuss reflection, peer feedback, and revisions. Give examples of a relevant famous person asking for feedback and refining work. Weave in this practice of reflection and feedback throughout.
- Share some exemplar "About the Author" texts, and ask students to be thinking about what they will share about themselves in that section.



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## LESSON 2: Pop-Ups, Drawings, and Flaps

### MATERIALS

#### Per student:

- several pieces of pre-cut card stock
- pencils and erasers

#### To share:

- permanent markers
- colored markers or colored pencils
- collage materials (decorative paper, newspaper, card stock)
- containers of paste with brushes or popsicle sticks
- various cut ribbons
- painters' tape
- small envelopes
- newspaper/tablecloths for tables
- reference materials

### VOCABULARY

Pop-ups, flaps, layout, design, and flow. Extreme weather vocabulary

### LEARNING GOALS:

*Students will understand:*

- How to create pop-ups, flaps, and pockets in their book form to support scientific content.
- How to think like an artist and scientist through investigating and illustrating knowledge.
- The importance of revision and feedback from others.

### Timeframe: 1.5 hours

Students will learn how book design and layout support nonfiction writing. They will create pop-up sections, flaps, and pockets to hold their research and additional drawings within the book pages.

### INSTRUCTIONS

## Step 1: Introduction

Share a book example with flaps and pop-ups. Show how these components emphasize the text and create a strong layout for the book. Demonstrate how to make a pop-up and a flap for longer text on the book page. Show how to add a pocket for additional information. Each student should have heavy paper/card stock to work with. Have students think about the big ideas in their book and their layout plan before gluing in components.

### Teaching Tips:

- Try a “sticky note” critique at the end of class. Have students look at each other's work and share with sticky notes one thing that's working and one question they have for the artist.
- Pair a student who is farther along with a student who needs extra support with fine motor components.

## Step 2: Drawing & Design Components

Students should work on drawing and design components, adding color when needed. When they feel close to complete, have them pause and reflect on their work and ask for peer feedback.

### Fun Fact:

About 700 years ago people used simple books with moving parts to teach about anatomy or make astronomical predictions. These pop-up and flap books were made for adults, not children!

**SEL SKILL:  
RELATIONSHIP SKILLS**

are the ability to establish and maintain healthy and rewarding relationships with diverse individuals and groups. This includes communicating clearly, listening actively, cooperating, resisting inappropriate social pressure, negotiating conflict constructively, and seeking and offering help when needed. Drawing, design, and bookmaking during classroom instruction provide opportunities to see a variety of expressions about similar content broadening empathy and building relationships.

## Step 3: Cut & Paste

Demonstrate how to carefully cut and paste pieces into the book, including adding text pieces to the flaps. Once they have received feedback and have decided on a layout, allow ample time for students to glue pieces in.



### Extra Time?

Students who finish early can begin to work on their About the Author page or write additional pieces for their book. For example, a “strange but true facts” section, safety precautions, or evacuation routes.

### Next Steps:

Students should have most of their book complete by the end of this class period. Their book covers should be complete with a title and drawing.

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## LESSON 3: About the Author

### MATERIALS

#### Per student:

- several pieces of pre-cut card stock
- pencils and erasers

#### To share:

- glue
- scissors
- additional collage materials

### VOCABULARY

autobiographical, timeline, inspiration, historical data, audience

### LEARNING GOALS

*Students will understand:*

- How to describe themselves in the third person.
- How information about the author supports audience engagement.
- The importance of revision and feedback from others.
- The role of the author and artist to inform us visually.



### Timeframe: 1 hour

Students will add a final page about the author, learning to write biographically.

### INSTRUCTIONS

## Step 1: Introduction

Share examples of About the Author sections. Make up your own to share. Have students write about themselves highlighting fun facts, what helps them be creative, biographical information, etc.

## Step 2: Refine Writing

Have students refine their writing, perhaps copy in clearer handwriting. Students should trace over the pencil with a sharpie. Author writing can be mounted on decorative paper or paste paper before being glued in.

### Teaching Tips:

- For students who are struggling, have them work in pairs and write about each other to get started. Then have them make corrections on what was written about themselves.
- Polaroid-type pictures can be a nice addition to the About the Author page.
- Add a funny fact about what helps you write in your author section. (Do you listen to music? Do you write in a special spot? Do you have to use a special pencil?).

### Extra Time?

Students who finish early can help a peer, help clean up, or begin working on Celebration of Learning posters or invitation pieces.

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## LESSON 4: Building the Book

### MATERIALS

#### Per student:

- pencils and erasers

#### To share:

- permanent markers
- containers of paste with brushes or popsicle sticks
- newspapers/tablecloths for tables
- reference materials

### VOCABULARY

publish, series, edition, signature, audience

### LEARNING GOALS

*Students will understand:*

- How to compile information in an organized way.
- How to think like an artist and scientist through investigating and illustrating knowledge.
- The importance of revision and feedback from others.
- The role of the author and artist to inform us visually.

### Timeframe: 1.5 hours

Students will paste writings and all drawings/illustrations into the book, finishing up any remaining pieces.

### INSTRUCTIONS

## Step 1: Introduction

Have students gather all components of their books including writing. Show an exemplar of a handmade book with all components, including about the author section.

## Step 2: Lay Out Components

Have students refine their writing, perhaps copy in clearer handwriting. Students should trace over the pencil with a sharpie. Author writing can be mounted on decorative paper or paste paper before being glued in.



### Teaching Tips:

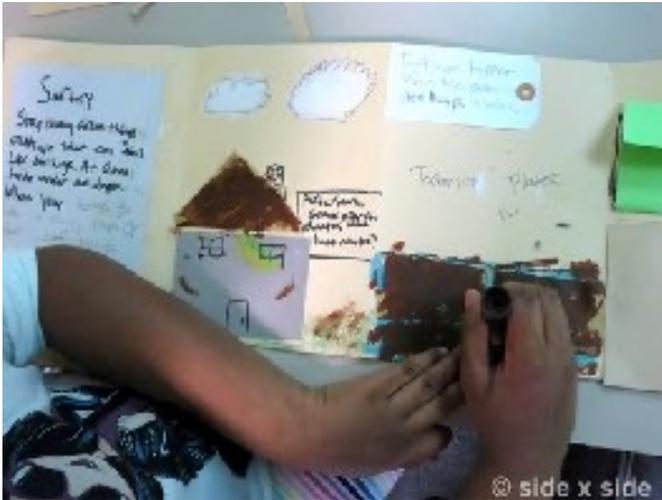
- Have a rubric or checklist for components of the book.
- Allow students to add a Table of Contents or a Glossary of Terms to their books.

## Step 3: Complete Missing Pieces

Check in with students who need to make additional pieces. As students complete any missing pieces, have them add them to their book layout.

## Step 4: Glue

Have students complete the gluing in of final drawings/illustrations, collage pieces, and writing, including the About the Author page. Then have them check in with the teacher.



### Extra Time?

Students who finish early can help a peer, help clean up, or begin working on Celebration of Learning posters or informational pieces. Students can also work on self-reflection writing.

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## Bookmaking: Extreme Weather Science



### CELEBRATION OF LEARNING

**Timeframe: 45 minutes – 1 hour**

Students will teach their peers and community about extreme weather using their books as a visual aid.

Students will have an opportunity to celebrate their work and share their books with teachers, parents, school community, and peers. This event is an important component of the unit, giving students an opportunity to reflect on their success, share their knowledge, and receive positive feedback on their hard work. Teaching artists and classroom teachers design this component to meet the needs of the students and the school community.

### Celebration Suggestions:

#### Host An Author's Tea

Invite students to share their books with peers in another class. Make it a special event by circulating and asking students about their work. Include refreshments!

#### Have a Book Tour

Have students take their books into younger classrooms to read and share what they have learned. Reserve a place in the school where students can proudly display their books.

#### Engage the Community

Invite families and community members in for a book share. Have students teach the guests about the bookmaking process and share facts about extreme weather!

#### **SEL SKILL: RESPONSIBLE DECISION-MAKING**

is the ability to make constructive and respectful choices about personal behavior and social interactions based on consideration of ethical standards, safety concerns, social norms, the realistic evaluation of consequences of various actions, and the well-being of self and others. The Celebration of Learning is an opportunity to demonstrate knowledge acquisition visually and collaboratively. It is a chance for students to work together making strong choices to represent their creative work.

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## Bookmaking: Extreme Weather Science

### Lesson Modifications and Extensions

#### Third Grade Weather Science

The same handmade book format can be used in an introductory weather science unit in third grade beginning with tools used to measure and record weather, weather patterns, and local scientists. Students can use drawing skills and math to visualize data and represent research.

Addresses Standards: CCSS.ELA-LITERACY.RI.3.3, ELA-LITERACY.W.3.7, MATH.CONTENT.3.MD.B.3, NGSS: E-SS2-1

#### Poetry: Sensory Weather Writing

Students use their five senses to consider different types of weather. Using literacy and drawing skills, they create a poem with illustrations and include it in their handmade book. This can be supportive to students struggling with writing and literacy skills.



#### Physical Theater: Performance of Extreme Weather

Students work together to create a performance piece about extreme weather patterns, impacts, and responses. Physical theater cements learning by taking apart information into small pieces and then putting it back together in physical form. This is particularly helpful for students who struggle with literacy and language.



#### Special Education: Paste Paper Books

This unit has been taught in a special education classroom with a focus on color, movement, reading accuracy, and research. Students began with making paste paper, a sensory and gross motor activity while considering one chosen form of extreme weather. The paste paper became the book cover and collage pieces of their book, while the extreme weather pattern became the central focus of their research and writing.

**COMMON CORE STATE STANDARDS**  
[corestandards.org](http://corestandards.org)

**Reading Standards for Informational Text:**  
 CCSS ELA literacy RI 4.10

**Writing:**  
 CCSS ELA literacy W 4.10

**Speaking and Listening:**  
 CCSS ELA literacy SL 4.1-10

**Vocab Acquisition:**  
 CCSS ELA literacy L4.1-10

**Math, measurement and Data:**  
 CCSS MATH CONTENT 4MD A 1-4

**21st CENTURY STUDENT OUTCOMES**  
[p21.org](http://p21.org)

**21st Century Interdisciplinary Themes:**  
 Global Awareness  
 Financial, Economic, Business and  
 Entrepreneurial Literacy  
 Civic Literacy

**Learning and Innovation Skills:**  
 Creativity and Innovation  
 Critical Thinking and Problem Solving  
 Communication and Collaboration

**Information, Media and Technology Skills:**  
 Information Literacy

**Life And Career Skills:**  
 Social and Cross-Cultural Skills  
 Leadership and Responsibility

**NATIONAL CORE ART STANDARDS**  
[nationalcoreartsstandards.org](http://nationalcoreartsstandards.org)

**Anchor Standard 1:** Generate and conceptualize artistic ideas and work. VA: Cr3.1.3a

**Anchor Standard 2:** Organize and develop artistic ideas and work. VA: Cr3.1.3a

**Anchor Standard 3:** Refine and complete artistic work. VA: Cr3.1.3a

**Anchor Standard 4:** Select, analyze, and interpret artistic work for presentation. VA:Pr5.1.3a

**Anchor Standard 6:** Convey meaning through the presentation of artistic work. VA:Pr6.1.3a

**Anchor Standard 7:** Perceive and analyze artistic work. VA:Re.7.1.3a

**Anchor Standard 8:** Interpret intent and meaning in artistic work. VA:Re8.1.3a

**Anchor Standard 10:** Synthesize and relate knowledge and personal experiences to make art. VA:Cn10.1.3a

**NEXT GENERATION SCIENCE STANDARDS**

**Earth's Systems:** 4-ESS2-2, 4-ESS3-1

**CASEL SOCIAL EMOTIONAL LEARNING SKILLS**

SEL is an integral part of education and human development. SEL is the process through which all young people and adults acquire and apply the knowledge, skills, and attitudes to develop healthy identities, manage emotions and achieve personal and collective goals, feel and show empathy for others, establish and maintain supportive relationships, and make responsible and caring decisions. [casel.org](http://casel.org)

- Self Management
- Self-Awareness
- Relationship Skills
- Responsible Decision-Making