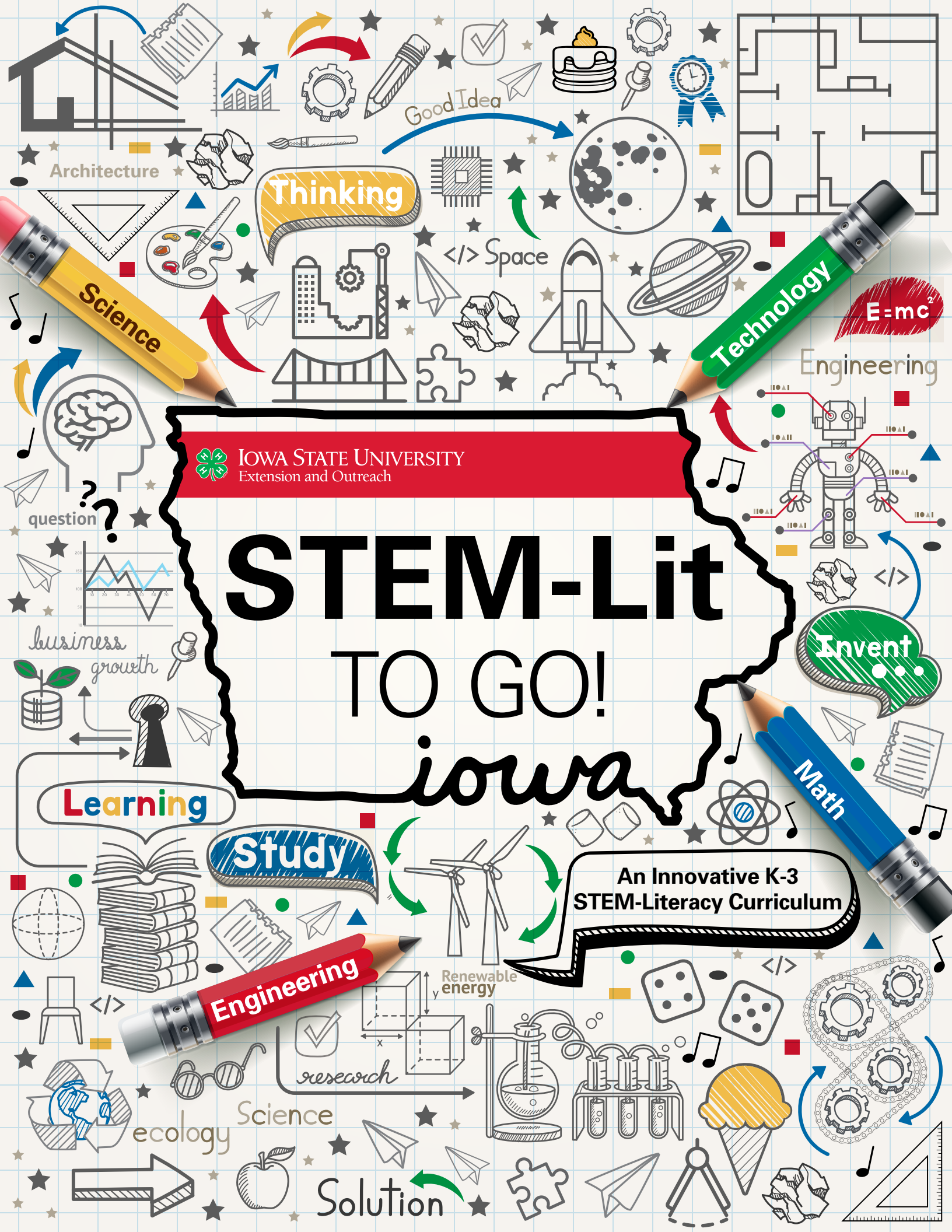
Iowa State University
Extension and Outreach
STEM-Lit
TO GO!
iowa
An Innovative K-3
STEM-Literacy Curriculum
Science
Technology
Engineering
Math
Thinking
Learning
Study
Invent
Engineering
Good Idea
Architecture
Space
E=mc²
question
business
growth
Renewable
energy
research
ecology
Science
Solution

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Acknowledgements

The STEM-Lit to Go! Iowa program, including this youth activity manual, is a collaborative effort led by Iowa 4-H Staff. This material was made possible by a grant from the Iowa 4-H Foundation with support from the Iowa Farm Bureau Federation.

Credits

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Emerge Marketing Solutions

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Iowa State University Extension and Outreach

STEM-Lit TO GO! iowa

Lessons

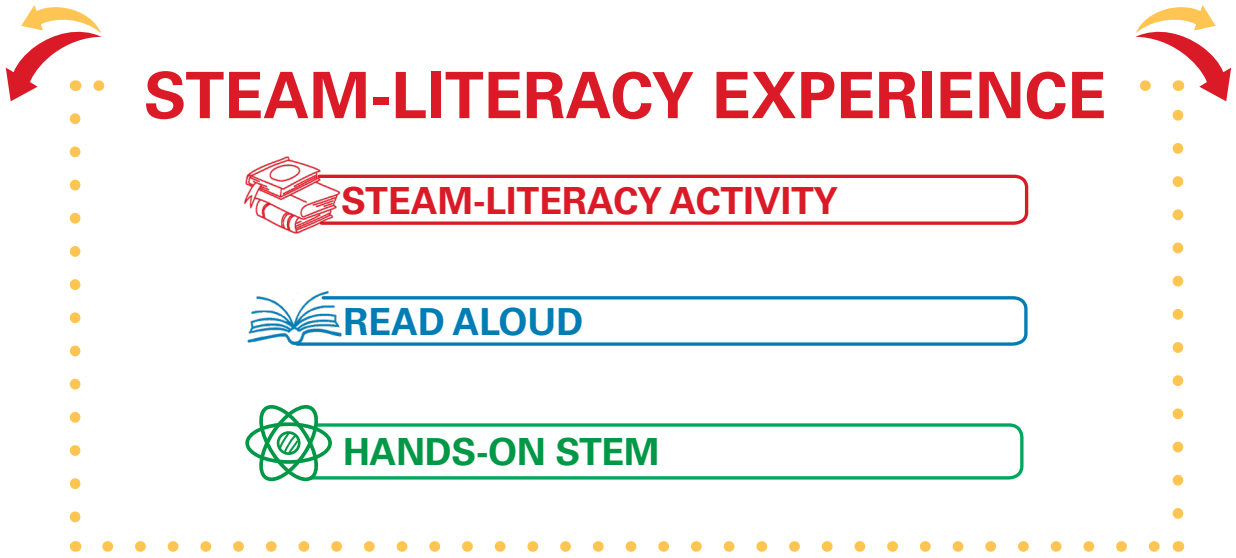
An Innovative K-3 STEM-Literacy Curriculum

OVERVIEW

STEM-Lit to Go! Iowa is an innovative 4-H program that supports the development of STEM and literacy skills for K-3 children. This informal education program utilizes a unique instructional framework to deliver integrated STEM-literacy activities that engage and support positive youth development. In addition, this exciting research-based program is designed to support the Next Generation Science Standards and the Common Core English Language Arts Standards.

Each STEM-Lit to Go! Iowa agenda contains five core elements. The first element is time for an opening and the 4-H pledge. Next, the main element of the agenda is presented. This is the STEM-literacy experience that incorporates a hands-on STEM activity, two types of text, and multiple opportunities to read, write, speak, and listen.
A community-building and healthy snack activity typically follows. Last, there is time for closing and connections. The elements can be rearranged as needed to meet the needs of your group.

Elements of **STEM-Lit** TO GO! *iowa*



EXPERIENTIAL LEARNING MODEL

STEM-Lit to Go! Iowa is designed around the Experiential Learning Model. Experiential learning utilizes a cyclical process where learners have opportunities to construct understandings through engaging, active, and hands-on experiences. The experiential learning model of Do, Reflect, and Apply includes the following phases:

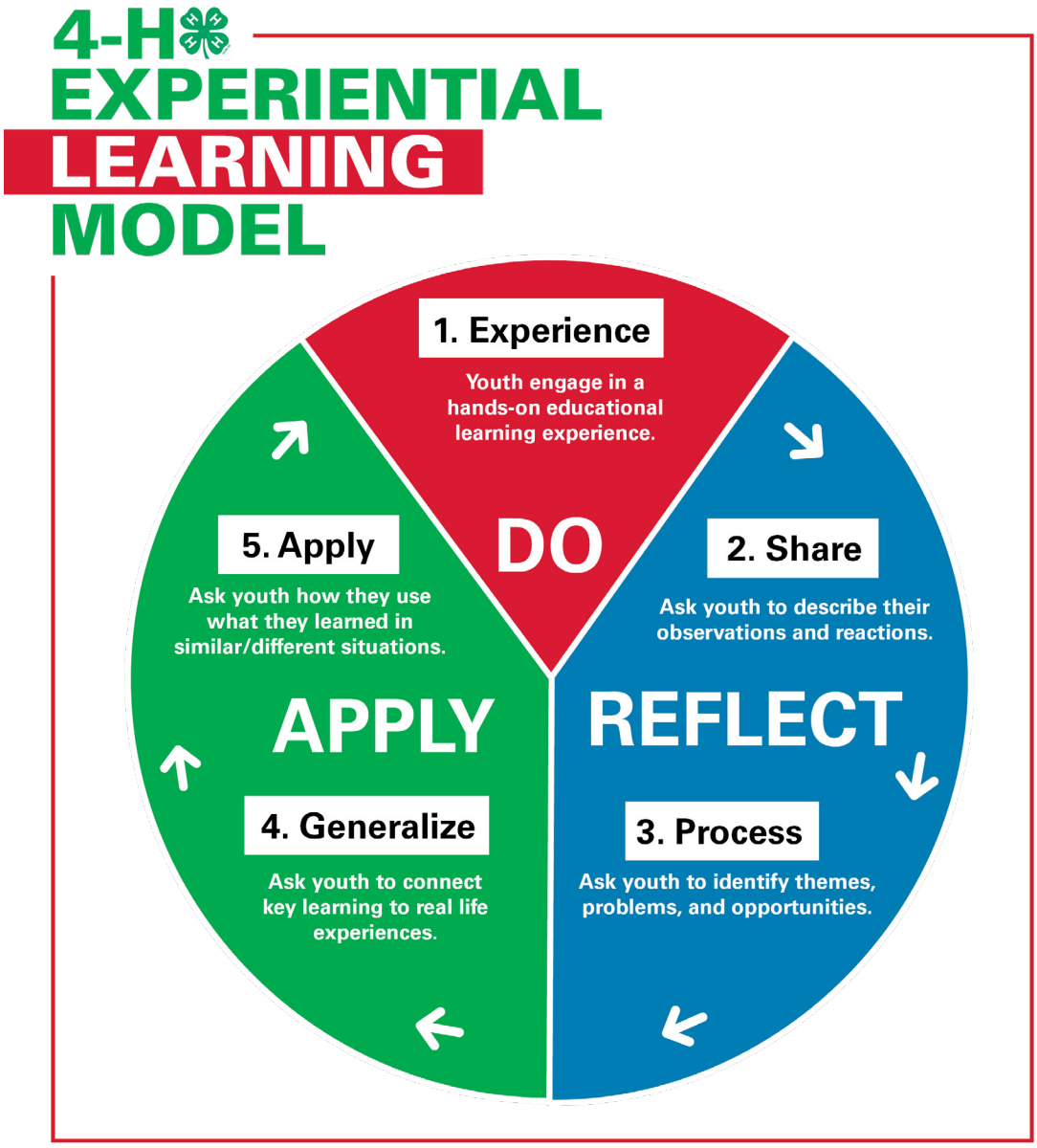
Experience: Children engage in a hands-on educational experience.

Share: Children are asked to describe their observations and reactions.

Process: Children identify themes, problems, and opportunities.

Generalize: Children connect learning to real life experiences.

Apply: Children share how they may use what they learned in similar or different situations.



EXPERIENTIAL LEARNING MODEL

The Experiential Learning Model requires those who lead activities to actively engage children and not simply disseminate knowledge. The process requires the active participation of children. The Experiential Learning Model is embedded into STEM-Lit to Go! and can be noted in the Flexible Experiential Sequence below.

Flexible Experiential Sequence for STEM-Lit to Go!

Fiction Text Tied to STEM Concept
Goals: Assess prior knowledge of STEM topic, generate or set up inquiry questions, introduce, and review literacy elements

Do

Hands-On STEM Experience
Goals: Participate in science and engineering practices, engage in STEM play, and collect data through writing

Reflect

Discussion/Non-Fiction Text Tied to STEM Concept
Goals: Reflect on/analyze STEM experiences and data collected, draw conclusions, check with experts of STEM content, introduce and review vocabulary

Apply

Extension/Application of STEM and Literacy Concepts
Goals: Connect STEM and literacy content to life, extend learning, share Home Connections Letter

- Ask open-ended questions while children participate in STEM play.
- Ask children about their ideas and listen carefully.
- Encourage children to engage with the materials and try out new ideas.

- Ask children to discuss the learning event with each other.
- Refer back to the STEM play and any data charts during the discussion.
- Ask children to discuss what they learned about the topic.

- Ask children to apply what they learned to new situations.
- Redesign or rebuild, incorporating what they learned.
- Ask children what they learned about themselves and the STEM-literacy concepts covered.

The STEM-Lit to Go! iowa curriculum is based on the Kolb Learning Model (1975) and Bybee's Learning Model (1977) through the infusion of the 4-H Experiential Learning Model.

SUPPORTING YOUTH DEVELOPMENT

Positive youth development builds on children's strengths and assets. It is an intentional process supported by caring and knowledgeable adults. Research highlights that structured out-of-school time learning, leadership experiences, and adult mentoring can assist children in developing skills that promote civic engagement, academic achievement, and healthy living choices (Lerner et. al, 2005). Effective youth development programs like 4-H Clover Kids are putting the research to work by focusing on three key areas:

- Positive and sustained relationships between children and adults
- Activities that build important life skills
- Opportunities for children to use these skills as participants and leaders in valued community activities

Practices to support positive youth development:

- Establishing a safe environment that fosters the building of relationships. All children need caring, supportive adults in their lives. Adults provide this by showing interest in, actively listening to, and fostering the assets of youth.
- Providing leadership opportunities for children. Creating opportunities to develop skills and confidence for leadership and self-discipline is important for youth development. Whenever possible, allow children to take the lead in activities.
- Modeling healthy living choices by providing healthy snacks and time for movement.
- Working to create an environment that supports each aspect of the 4-H pledge.engineering design process.

4-H Pledge

English

I pledge my head to clearer thinking, my heart to greater loyalty, my hands to larger service, and my health to better living, for my club, my community, my country, and my world.

Spanish

Prometo usar mi mente para pensar con más claridad, mi corazón para ser más leal, mis manos para ser más servicial,mi salud para cuidarme más,por mi club, mi comunidad, mi país y mi mundo.

Reference:

Lerner, R. M., Lerner, J. V., Almerigi, J. B., Theokas, C., Phelps, E., Gestsdottir, S., Naudeau S, Jelicic H, Alberts A., Ma L., & Smith, L. M. (2005). Positive youth development, participation in community youth development programs, and community contributions of fifth-grade adolescents: Findings from the first wave of the 4-H study of positive youth development. The Journal of Early Adolescence, 25(1), 17-71.

SUPPORTING LITERACY DEVELOPMENT

Literacy skills are an essential component and focus of the STEM-Lit to Go! program. For this program, literacy is defined as the ability to read, write, speak, and listen. Literacy skills are strengthened through the inclusion of a variety of practices such as interactive read alouds, modeled writing, and group discussions.

Practices to support literacy development:

Conduct Interactive Read Alouds. Engage the children with the book before, during, and after. These prompts are intended as a starting point to conversation about the book, which links to the topic of each lesson. Here is a sample of what to do before, during, and after reading one of the STEM-Lit to Go! books (Fisher, Flood, Lapp & Frey, 2004).

- Before Reading: Take a picture walk (flip through the pictures of the book together and make predictions of what may be happening).
- During Reading: Seek out predictions. Ask children what they think may happen next. What may the outcome of the book be?
- After Reading: Refer back to the Before Reading prompts. Were the predictions correct? Or did the story end differently than anticipated?

Focus on Vocabulary. Focus on words that may be new to the children. Ideas for ways to introduce and develop strong vocabulary follow (Snell, Hindman, & Wasik, 2015).

- Define new words using child-friendly terms
- Discuss and ask children questions about the new words
- Reread the books so words are heard again
- Engage in retelling activities that encourage children to use the words
- Use the new words in other activities such as the STEM hands-on activity

Model Writing. It is important to model writing as much as possible with the children, for a variety of purposes. For example, write down answers to a group question or record data.

Provide Speaking Opportunities. Work to get children speaking and sharing ideas as much as possible. One idea for group discussions might be to use the think-pair-share strategy. Simply ask children to first think, then share their answers with a partner, and then the whole group discusses.

Read Aloud Tips

1. Preview the book
2. State purpose for reading to children. Ex: Today I want you to listen for...
3. Read with animation and expression
4. Ask questions before, during, and after reading
5. Model enthusiasm for reading

References:

Fisher, D., Flood, J., Lapp, D., & Frey, N. (2004). Interactive read alouds: Is there a common set of implementation practices?. The Reading Teacher, 58(1), 8-17.

Snell, Emily K., Hindman, Annemarie H. & Wasik, Barbara A. (2015). How can book reading close the word gap? Five key practices from research. The Reading Teacher, 68(7), 560–571.

SUPPORTING STEM PLAY

STEM play is needed to help children become strong STEM thinkers. Play allows for children to pursue questions, investigate ideas, and begin to form and test theories about the world around them. As the meeting agendas are implemented, work to allow children time to play with the materials and their ideas. This may mean stepping back or letting a meeting agenda unfold in an unplanned way. This flexibility and support of STEM play is vital for the development of STEM concepts and critical thinking. Research from The Center for Childhood Creativity supports this notion and discusses how "STEM education should include robust, frequent, and varied opportunities for play through the third grade" (2018).

Children are natural explorers and creators. They want to know why, how, and what. Adding STEM play into Clover Kids will assist in guiding that natural sense of curiosity to new and deeper discoveries. STEM play allows for the development of STEM process skills that are an essential component to the STEM-Lit to Go! program. Here are the STEM process skills promoted by the Next Generation Science Standards (2013) that are infused throughout the program:

- Planning and carrying out investigations
- Obtaining, evaluating, and communicating information
- Engaging in argument from evidence
- Constructing explanations and designing solutions
- Using mathematics and computational thinking
- Analyzing and interpreting data
- Developing and using models
- Asking questions and defining problems

Practices to support STEM process skills development:

Focus on the Big Idea(s): Keep the STEM learning goal or the big idea of the meeting agenda in mind as you move through the agenda. If needed, familiarize yourself with the STEM concepts.

Be Organized: Be organized and ready for the STEM portion of the agenda. Proper preparation can sometimes mean the difference between a successful or unsuccessful STEM lesson. Plan ahead of time, try the activities yourself, collect the needed supplies, and familiarize yourself with the STEM concepts.

Let Children Take the Lead: Encourage children to take the lead in planning investigations and discussions. Work to keep them involved and leading throughout the experience.

Ask Strong Questions: Use questioning to encourage children to share their thoughts and ideas. There are many times that the best question is "Why?" or, "Why do you think that?" Try to ask questions from each of the levels of questioning listed below.

Use the Engineering Design Process: Encourage children to use and understand the engineering design process.

Engineering Design Process

Ask: Identify the goal or problem to solve

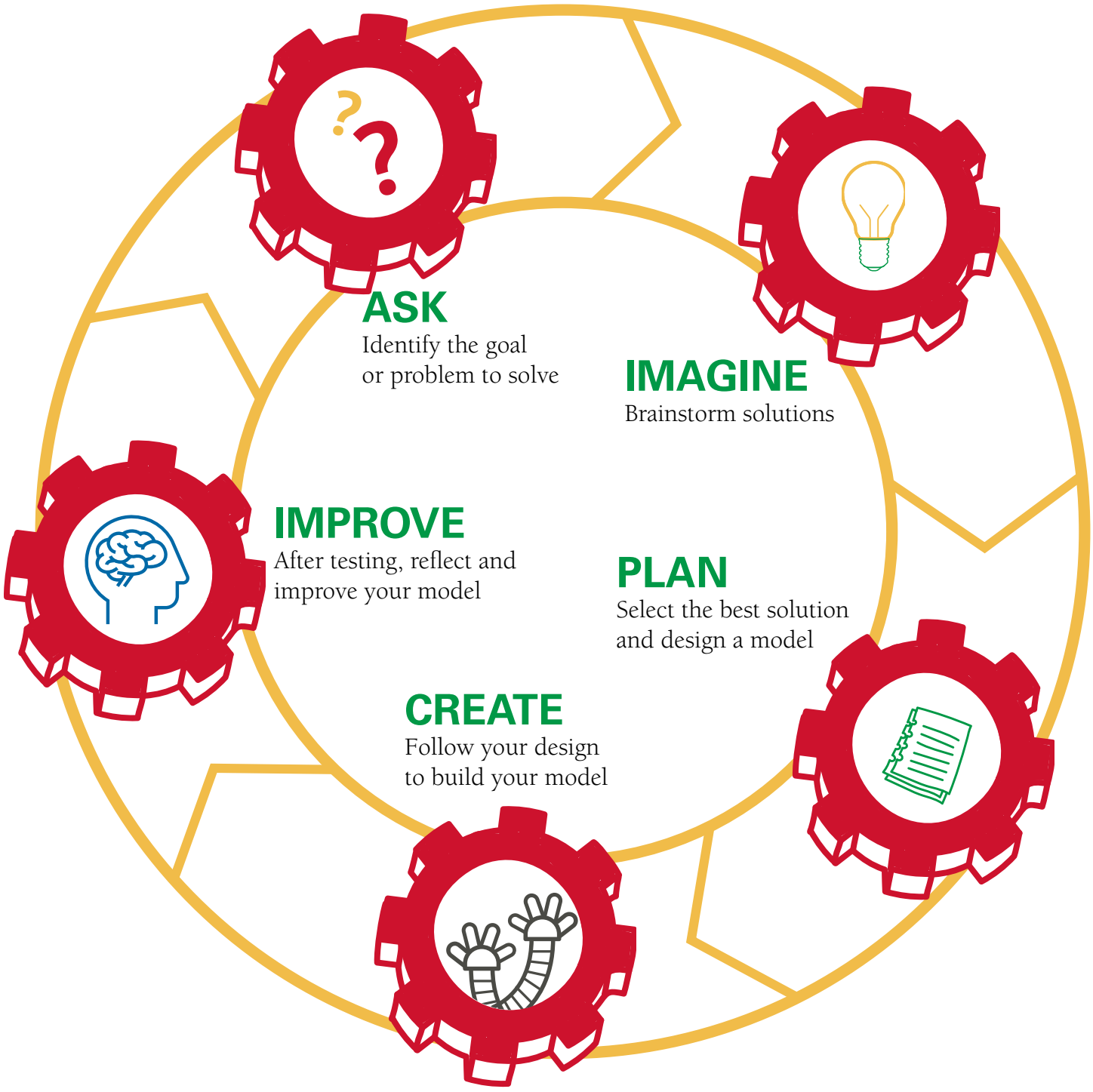
Imagine: Brainstorm solutions

Plan: Select the best solution and design a model

Create: Follow your design to build your model

Improve: After testing, reflect and improve your model

ENGINEERING DESIGN PROCESS



CONNECTIONS TO THE COMMON CORE (CC) LANGUAGE ARTS STANDARDS

STEM-Lit to Go! Iowa supports the English Language Arts Standards identified in the CC (2010). Children in kindergarten–3rd grade will work on mastering reading, writing, speaking, listening, and language standards that will assist them in developing the language arts skills needed for success in college and their career. STEM-Lit to Go! assists in supporting children as they strive to meet the CC English Language Arts Anchor Standards. A few of the core standards supported by implementation of the program include but are not limited to:

Anchor Standards for Writing:

Text Types and Purposes: Children write arguments, informative/explanatory, or narrative pieces.

Range of Writing: Children write routinely over extended and shorter time frames for a variety of purposes and audiences.

Anchor Standards for Reading:

Key Ideas and Details: Children read closely to determine central ideas or themes.

Craft and Structure: Children interpret words and phrases as well as analyze the structure of texts.

Anchor Standards for Language:

Vocabulary Acquisition and Use: Children determine or clarify the meaning of unknown words and phrases, using various tools such as context clues.

Conventions of Standard English: Children demonstrate command of conventions of standard English grammar and usage when writing or speaking.

Anchor Standards for Speaking and Listening:

Comprehension and Collaboration: Children will prepare for and participate effectively in a range of conversations with diverse partners, building on ideas and expressing their own.

Presentation of Knowledge and Ideas: Children will present information, findings, and supporting evidence so that others can follow a line of reasoning.

Reference:

National Governors Association Center for Best Practices, Council of Chief State School Officers (2010). Common core state standards. Washington D.C.: National Governors Association Center for Best Practices, Council of Chief State School Officers.

A CHAIR FOR BEAR

STEM-Lit TO GO! iowa

Children work with the engineering design process to build a chair for Goldilocks. In addition, children are introduced to the fairy tale genre and explore text-based drama.

AGENDA

Pledges and Announcements

STEM-Literacy Activity

Introduce Iowa's Largest Rocking Chair

Read Book Goldilocks and the Three Bears by James Marshall

Design and Build a Chair for Goldilocks

Test Chairs, Discuss, Redesign Chairs

Read Book Forces and Motion by Angela Royston

Healthy Snack: Gorp Porridge

Community Building: Maker Theater

Closing: 4-H Home Connections Letter

KEY VOCABULARY

HEIGHT
a measurement of how tall a person or thing is: the distance from the bottom to the top of a person or thing

WIDTH
the distance from one side of something to the other side: a measurement of how wide something is

FAIRY TALE
a story, usually for children, about elves, dragons, fairies, or other magical creatures

Materials

- ❑ Photo of Iowa's Largest Rocking Chair*
- ❑ Chart Paper/Marker
- ❑ Measuring Tape
- ❑ Book Goldilocks and the Three Bears by James Marshall
- ❑ Engineering Design Process Poster*
- ❑ Cardboard (Precut If Wanted)
- ❑ Makedos
- ❑ Makedo Tools
- ❑ Cardboard Cutting Tool (Adult Use Only)
- ❑ Paper/Pencils
- ❑ Book Forces and Motion by Angela Royston
- ❑ Maker Theater Props, Costumes
- ❑ Gorp Recipe and Ingredients
- ❑ Copies of Three Bears Paper Puppets*

** Included with STEM-Lit TO GO!*

Healthy Snack Ingredients

- ❑ Popcorn
- ❑ Nuts (Beware of Allergies)
- ❑ Chocolate Candies
- ❑ Raisins or Other Dried Fruit

PLEDGES AND ANNOUNCEMENTS

We encourage you to begin your Clover Kids meeting by reciting The Pledge of Allegiance, followed by the 4-H Pledge, when appropriate.

4-H Pledge

I pledge my head to clearer thinking, my heart to greater loyalty, my hands to larger service, and my health to better living, for my club, my community, my country, and my world.

STEAM-LITERACY ACTIVITIES

Prior to children arriving, mark the size of Iowa's largest rocking chair in room (height 11 feet, width 4.5 feet).

Introduce the words height and width. Then show how long a foot (12 inches) is to the children, on the measuring tape. Ask the children to estimate the following in feet.

How tall do you think Iowa's largest rocking chair is?

What do you think is the height of the chair?

How wide do you think Iowa's largest rocking chair is?

What do you think is the width of the chair?

Have the children guess the height and width of the chair in feet. Record their guesses on chart paper. Show the children a picture of the largest walnut rocking chair in Iowa and share the measurements. The height of the chair is 11 feet, and the width is 4.5 feet. Using a measuring tape, show the children the actual height and the width of Iowa's largest rocking chair (previously marked).

Key Vocabulary

HEIGHT
a measurement of how tall a person or thing is: the distance from the bottom to the top of a person or thing

WIDTH
the distance from one side of something to the other side: a measurement of how wide something is

READ ALOUD

Share that we are now going to read a book in which the size of the items is really important. Introduce the book Goldilocks and the Three Bears by James Marshall.

BEFORE

Ask if anyone has ever read the story Goldilocks and the Three Bears. If needed, give a short summary or ask the children to give a summary.
Next, ask the children: Does anyone know what kind of story "Goldilocks and the Three Bears" is? Share that it is a fairy tale. A fairy tale is a story, usually for children, about elves, dragons, fairies, or other magical creatures. Then ask children to pay attention to what happens to the chairs in the story.

DURING

Draw attention to the pages that discuss the chairs. Also, focus on the vocabulary in the story by providing child friendly definitions of the following words:
Porridge: another name for oatmeal
Scalding: very hot
Tuckered: very tired
Smithereens: small broken pieces or tiny bits

Key Vocabulary

FAIRY TALE
a story, usually for children, about elves, dragons, fairies, or other magical creatures

AFTER

Hold a discussion on the book. Ask:
What is your favorite part of this fairy tale? Why?
What happened to the chairs in the story?
Why do you think baby bear's chair fell apart when Goldilocks sat on it?
Has a chair ever fallen apart when you sat on it?

HANDS-ON STEM

Conduct a chair poll.

What do we need to build a strong chair?

Record their answers on a piece of chart paper.

What do you think is the most important thing on our list?

Circle or star that item on the list, for reference later.

CHALLENGE

Introduce the design challenge from Papa and Mama Bear.

Papa and Mama Bear would like for you to build a chair for unexpected company like Goldilocks. They would like a chair that is strong and comfortable. They kindly request that you try out the chair first to help make sure that it is strong and comfortable.

P.S. They would also like the chair to look nice and have some fun designs.

Introduce the design materials of cardboard, Makedos, Makedo tools, and markers. Model how to use the Makedo tools by showing how to put two pieces of cardboard together. If your group is younger, extra adults will be useful for this section of the meeting agenda.

Highlight the engineering design process poster. Then break children into small groups to begin the design process.

Ask the children to draw or create a model of their chair on paper that may meet the challenge from Papa and Mama Bear.

Once their design has been shared with the adult leader, have the groups begin the building process.

Once completed, take a chair tour. Have each group present and do a sit test with their chair. Test each chair to see if it will hold up to the weight of a child. Record this data on a chart. Be sure to share that it is ok if the chair breaks, because it can always be redesigned!

*Note: If Makedos and the Makedo tools are not available, duct tape could be substituted. In addition, please encourage children to design low-to-the-ground chairs and to sit slowly onto the chair when testing.

Group Name	Holds Weight?	Tape Drawing of Chair Here

Examine the data chart as a group. Discuss the results. Questions to ask may include:

What type of chair held up the best?

What do you think helped to make that chair strong?

Did they all work equally well?

What changes may you make now if you could redesign your chair?

If time permits, have the children do a redesign on the chairs and test them again.

Do

Ask open-ended questions while children participate in STEM play.

Ask children about their ideas and listen carefully.

Encourage children to engage with the materials and try out new ideas.

Optional

Using the same design challenge and materials shared previously, have the children design chairs for a doll/bear or other object to "sit" in. This will reduce the amount of materials needed and can allow for each child to design his/her own chair.

READ ALOUD

Read the book *Forces and Motion* by Angela Royston. Read the section in the book about balanced and unbalanced forces, on page 12.

BEFORE

Introduce the book and then read the top of page 4 that gives the definition of "force."
Hold a brief conversation about force with the children and ask them to think about how force applies to the chairs that they built.

AFTER

Read page 12 with the group.
Encourage the children to listen and think about how what we are reading may apply to our chair building. Vocabulary reminder: Static or not moving.

DURING

Discuss what was read as a group.
Then if wanted, read other sections of the text.

Conduct the chair poll again.

What do we need to build a strong chair?

Record their answers on a piece of chart paper.

What do you think is the most important thing on our list?

Circle or star that item on the list. Compare this poll to the one done earlier. See if the children's thinking has changed over the course of the meeting.

Reflect

Ask children to discuss the learning event with each other.

Refer back to the STEM play and any data charts during the discussion.

Ask children to discuss what they learned about the topic.

Apply

Ask children to apply what they learned to new situations.

Redesign or rebuild incorporating what they learned.

Ask children what they learned about themselves and the STEM-literacy concepts covered.

HEALTHY SNACK

Gorp Porridge

Make gorp porridge with the children. It is a mix of snack items such as popcorn, nuts (beware of allergies), chocolate candies, raisins, or other dried fruit. Place the gorp in "porridge" bowls.

COMMUNITY-BUILDING

Maker Theater

Retell the Goldilocks and the Three Bears story through drama.

1. To begin, gather or create props for the story. Consider using the chairs built by the children and create any other props that the group would like to make. Ideas for props to be created may include: bowls for porridge, a door, table, or forest trees.
2. If wanted, add costumes too! Ideas for costumes include character name signs, bear ears, or clothing for Goldilocks.
3. Assign roles to the children, then have an adult or child read the story while the group or a small group acts it out. Roles can include: Narrator, 3 Bears, Goldilocks. The story may need to be acted out more than once so that everyone gets a chance to performand gets a chance to practice being a good audience member.
4. Consider performing the story again as a group for parents/guardians when children are picked up for the day.

Home Connection

Remember to send home or email the 4-H Home Connections Letter to extend the learning and fun!

CLOSING

Share the take-home puppets with the group. Encourage the children to act out or retell the story at home, too.

4-H CLOVER KIDS

DEAR CLOVER KIDS PARENTS AND GUARDIANS,

Today at Clover Kids, we learned more about the Engineering Design Process and how to build a sturdy chair! Did you know that Iowa's largest walnut rocker is found in West Amana? We learned about the engineering design process and the fairy tale genre through fun and engaging activities such as:

- Reading Goldilocks and the Three Bears by James Marshall.
- Building cardboard furniture.
- Acting out the story of the three bears.

- The engineering design process can help us solve problems.
- Teamwork skills are important!
- Math is an important component of STEM activities.

AT HOME

- Design more furniture (or other fun things) out of cardboard at home. Share a photo of your creation with the group.
- Practice estimating at home. Guess how tall or wide something is and then measure. Were you close?
- Color and cut out the take home puppets to retell the story of *Goldilocks and the Three Bears* at home.

DIG DEEPER

- Explore more about Iowa's largest walnut rocking chair (and other Iowa record holders) by scrolling through the following link: https://www.traveliowa.com/getinspireddetails/biggest--smallest----br-tallest-and-crookedest/87/
- Read a *Guinness Book of World Records* book to learn about larger-than-life items!
- Read *Goatilocks and the Three Bears* by Erica S. Perl for a fun twist on the story!

Thank you for being a part of Clover Kids today! We look forward to seeing you at our next meeting.

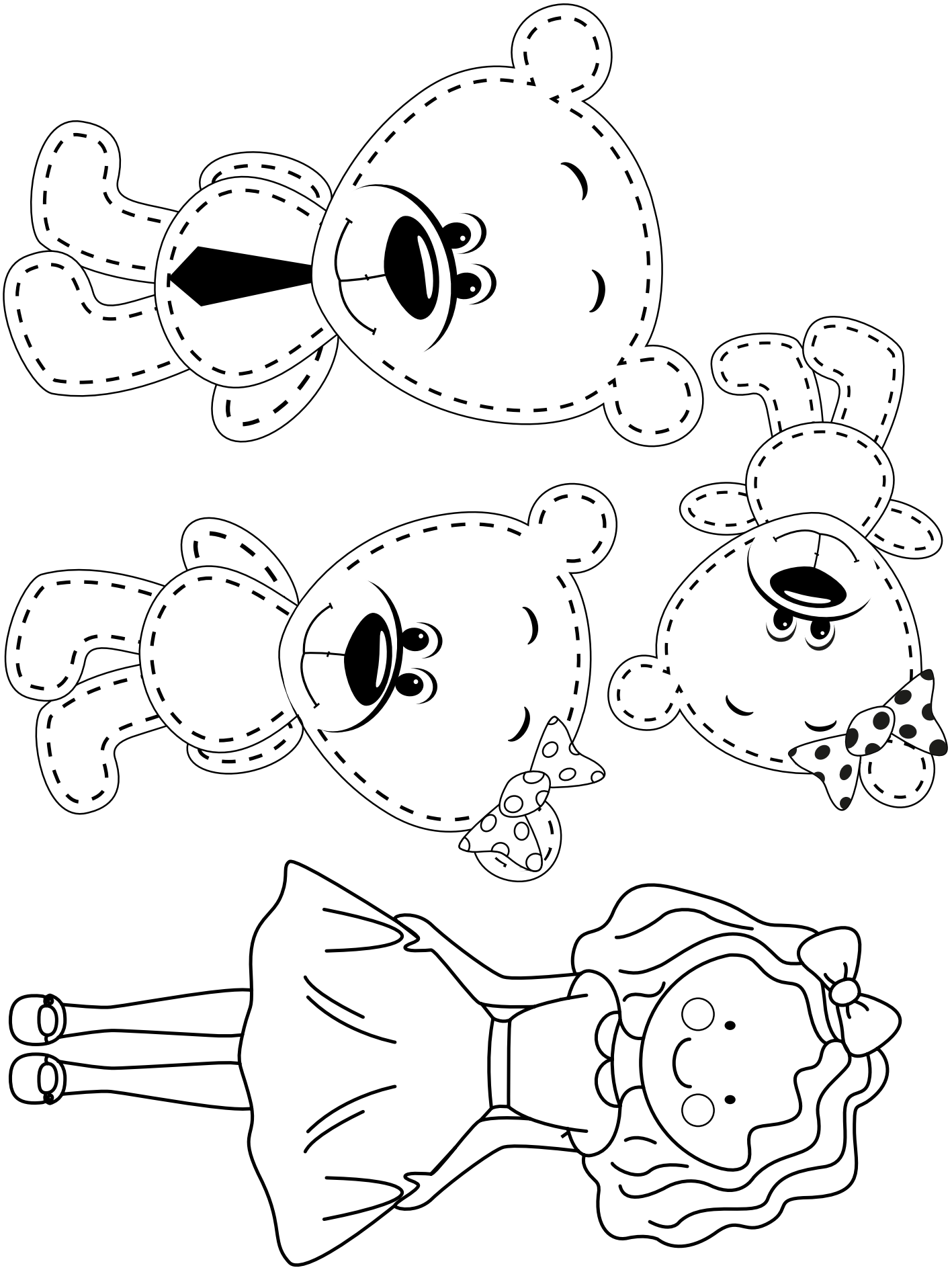
Sincerely,

Your Clover Kids Leader

IOWA STATE UNIVERSITY
Extension and Outreach

A CHAIR FOR BEAR

THREE BEARS PAPER PUPPETS



A CHAIR FOR BEAR

IOWA'S LARGEST ROCKING CHAIR

Iowa's largest chair is an 11-foot-tall rocker, located in the Broom & Basket Shop in West Amana, Iowa.

Photo courtesy of Broom & Basket Shop

BLAST OFF

STEM-Lit TO GO! iowa

BIG idea

Children learn about being an astronaut and participate in space themed learning events.

AGENDA

Pledges and Announcements

STEM-Literacy Activity

Read book *A is for Astronaut* by Clayton Anderson

Conduct Space Activities While Reading: Rocket Challenge, Parachute Challenge, Cooperative Pass Game, Solar Lineup Game, Mission Challenge

Create Book Page

Healthy Snack: Star-Shaped Foods

Community Building: Rocket Relays

Closing: 4-H Home Connections Letter

*This meeting agenda contains multiple learning experiences, you may need to reduce the number of space activities, or complete in multiple sessions.

KEY VOCABULARY

ASTRONAUT
a person who travels in a spacecraft into outer space

LAUNCH
to send or shoot (something such as a rocket) into the air, water, or outer space

COOPERATE
to work together: to work with another person or group to do something

CHALLENGE
to test the ability, skill, or strength of (someone or something): to be difficult enough to be interesting to (someone)

Materials

- ❑ Photo of Astronaut Peggy Whitson
- ❑ Photo of Astronaut Clayton Anderson
- ❑ Book *A is for Astronaut* by Clayton Anderson
- ❑ Alphabet Letter Cards
- ❑ Engineering Design Process Poster*
- ❑ Scissors
- ❑ Straws
- ❑ Pencils
- ❑ Paper For Rockets (Cut Into Strips)
- ❑ Rulers or Tape Measures
- ❑ Rocket Challenge Sheet*
- ❑ Plastic Bags or Pieces of Cloth
- ❑ String
- ❑ Jumper Figurine
- ❑ Tape
- ❑ Stuffed Animal or Soft Toy
- ❑ Trading Card Set (Link)
- ❑ Mission Challenge Box: Tubing, Tape, Containers, Plastic Bags, String, Etc.
- ❑ Drawing Paper
- ❑ Crayons or Markers

* Included with **STEM-Lit** TO GO!

Healthy Snack Ingredients

- ❑ Star-Shaped Cookie Cutter
- ❑ Watermelon, Sandwiches, Etc.

PLEDGES AND ANNOUNCEMENTS

We encourage you to begin your Clover Kids meeting by reciting the Pledge of Allegiance, followed by the 4-H Pledge, when appropriate.

4-H Pledge

I pledge my head to clearer thinking, my heart to greater loyalty, my hands to larger service, and my health to better living, for my club, my community, my country, and my world.

STEM-LITERACY ACTIVITY

Share with children that you are going to be asking a question and that you want them to draw their answer to the question on the paper provided. Hand out drawing paper and crayons/markers.

Ask children to draw an answer to the following question:

When I say the word "space," what do you think of?

Share a time limit for the drawing with the children, such as two minutes.

When done, ask the children to hold up their pictures and encourage them to look at their friends' drawings too.

Hold a brief discussion about the pictures.

Thank you for sharing your pictures and what you know about space. We are going to be learning even more about space today with a fun book and activities!

Key Vocabulary

ASTRONAUT
a person who travels in a spacecraft into outer space

READ ALOUD

Share that Iowa has been a part of helping the world learn more about space. Then briefly overview the two examples below.

The first example is Peggy Whitson.

Bio link: https://www.nasa.gov/sites/default/files/atoms/files/whitson.pdf

Hold up her picture and share: Peggy grew up in Iowa and was an astronaut for NASA. She holds the record for the longest single space flight by a woman and is the first female astronaut to command the International Space Station twice.

The second is Clayton Anderson.

Bio link: https://www.nasa.gov/sites/default/files/atoms/files/anderson_clayton.pdf

Hold up his picture and share: Did you know that he is a retired astronaut who went to Iowa State University? He wrote this really fun alphabet book about his life as an astronaut. Let's take a closer look!

Share that you will be reading this book in parts today because we will be stopping to do some fun space activities that go with different letters of the alphabet. Let's get started!

BEFORE

Introduce the book, reading the title, author, and illustrator.
Also, ask the children to pay attention to the space word that goes with each letter of the alphabet.

DURING

Take part in a variety of activities that follow.
In addition, each time a new letter is introduced, place the alphabet letter and word card up in a spot the group can see and review the word that goes with the letter.

READ ALOUD

When reading this book, it may work well to read the main text (or the text that ties to each letter) first. Then as time permits, read the text along the side of the page to help answer questions or to add depth to the children's understanding. In addition, remember to stress the Engineering Design Process throughout this lesson.

HANDS-ON STEM

Do

Read pages A for Astronaut and B for Blast Off. Be sure to place the letter or word card out when introducing each page. Introduce the straw rocket activity. Note the tie to the text—or that our rockets are going to blast off!

Make your straw rocket:

1. Take the strip of paper (about 4 cm by 28 cm long) and roll the strip around a pencil.
2. Tape the long seam securely to make a long paper tube.
3. Close off one end to make a nose cone for the rocket. This can be done by simply folding over the end and taping it or gathering the end together (squishing it) and taping.
4. Cut out three or four fins (triangle shapes) and tape the fins to the lower end of the rocket.
   Bend the fins outward and be sure to space them evenly.
5. Check your rocket. Hold it horizontal at eye level and drop the rocket. The nose should hit first—if not, the rocket may not be stable for flight. Make changes such as larger fins to help create a more stable rocket.
6. Model how to launch rockets away from other children and stress safe practices such as using a "launch zone."

*Note: If rolling the rocket paper around a pencil is tricky for children, consider purchasing larger straws for the rocket body instead. This larger straw should fit fairly snuggly over the smaller straw. Be sure to close off one end of the larger straw tightly with tape so that the rocket will launch successfully!

Introduce the rocket challenges:

Provide one Rocket Challenge sheet to each child, or replicate the sheet on chart paper for group data collection.

- How high can you make your rocket go? Predict, launch, measure, record.
- What changes can you make to make it go higher? Write, measure, record, compare.
- How far can you make your rocket go? Predict, launch, measure, record.
- What changes can you make to make it go farther? Write, measure, record, compare.
- Come up with your own challenges!

Key Vocabulary

LAUNCH
to send or shoot (something such as a rocket) into the air, water or outer space

Ask open-ended questions while children participate in STEM play.

Ask children about their ideas and listen carefully.

Encourage children to engage with the materials and try out new ideas.

Key Vocabulary

CHALLENGE
to test the ability, skill, or strength of (someone or something): to be difficult enough to be interesting to (someone)

Discuss the rocket challenges:

Reflect Apply

Discuss as a group what changes were made to help the rockets go even higher/farther.

Ask the children to refer back to what they did during the challenge and the data collected.
Encourage the children to share their thinking and model what they did with the group. Then discuss how what they observed may be seen in other ways in their lives.

Read page L for Landing. Be sure to place the letter or word card out when introducing the page. Then do the parachute activity. Be sure to note the tie to the text or the need for a safe landing.

Make your parachute:

Do

1. Cut a circle out of a plastic bag or cotton cloth. The size is up to you, but bigger is often easier to work with!
2. Punch a minimum of four holes around the edge of the circle. If the plastic needs some reinforcement, place a piece of tape on the bag, and then punch the hole.
3. Tie a piece of string to each hole; the pieces should be the same length.
4. Tie the strings together under the parachute, and then attach the figure.

Introduce the Parachute Challenge:

Go to your parachute dropping place. Make a target out of tape on the floor. Then have the children drop their parachutes one at a time, trying to hit the target. Do not move the parachutes until after the group discussion.

Discuss the Parachute Challenge:

Reflect Apply

Discuss as a group which parachutes landed on or close to the target.

Why do you think that those parachutes landed so close?
Discuss. Now that we know more about parachute designs, would there be any changes you would make to your parachute?

If time permits, redesign the parachutes and try the challenge again.

Read page P about Planning. Place the letter or word card out when introducing the page. Then play the cooperative game that follows. Be sure to note the tie to the text, or the need to be great team members at NASA!

Cooperative Game Directions: Cooperative Pass

Do

Children try to pass an object (such as a stuffed animal or other soft toy) around the circle without using their hands or letting the object touch the floor. It can be helpful to give examples of how to pass the object, such as using elbows or knees before starting. Have the group create a plan first, and then try it out. Did it work?

It is also recommended to keep the group size to no more than 10. Try adding additional items to be passed so that more children can actively participate.

Discuss the game:

Reflect Apply

Discuss as a group how they were able to work together to pass the toy. Discuss the importance of being able to work cooperatively with others.

Ask children to discuss the learning event with each other.

Refer back to the STEM play and any data charts during the discussion.

Ask children to discuss what they learned about the topic.

Ask children to apply what they learned to new situations.

Redesign or rebuild, incorporating what they learned.

Ask children what they learned about themselves and the STEM-literacy concepts covered.

Ask open ended questions while children participate in STEM play.

Ask children about their ideas and listen carefully.

Encourage children to engage with the materials and try out new ideas.

Key Vocabulary

COOPERATE
to work together: to work with another person or group to do something

Read page U about Universe. Place the letter or word card out when introducing the page. Then participate in the solar system mix-up game that follows. Be sure to note the tie to the text or our place in the universe!

Solar Lineup

Present the NASA Solar System Trading Card Jr. Set to the children and review the information on them. Then ask for their help listing the planets in order of their distance from the sun. (Mercury, Venus, Earth, Mars, Jupiter, Saturn, Uranus, and Neptune)

Link: http://amazingspace.org/uploads/pdf/name/51/solsyst_tradecards_jr.pdf

Play a Lineup Game

After presenting and reviewing the cards, hand out the cards to the children (one per person if possible) until they are all gone. Ask them to line up as quickly as possible in the right order. Repeat until everyone has had a turn.

Read page Y for Yellow. Be sure to place the letter or word card out when introducing the page. Then participate in the Mission Challenge. Note the tie to the text, or the fact that sometimes we need to be ready to solve problems quickly!

Present the Mission Challenge (Modeled after Apollo 13)

The astronauts in space need help keeping the air they breathe healthy. Using only the materials presented to you in the box, work together to create an air filter, or something to help create healthy air for the astronauts. Note: the air filter should stand alone and not be connected to the children's bodies. See the real-life Apollo 13 filter as an example online.

Create air filter in teams

Create a machine that your team thinks will help keep the air healthy for the astronauts. Be ready to present your machine when you are finished. When all of the groups are finished, have them present their ideas! Congratulate the children on their presented ideas.

Discuss the game

Discuss as a group how they were able to work together to create the filter. Then discuss the importance of being able to work cooperatively with others. In addition, consider referencing the Apollo 13 mission and show a photo of the actual filter that was created to help three astronauts in space.

As a group, discuss some of the fun things done that day and review the letter/word cards.

Share that to finish the book, we will be creating our own book page. Now ask the children the question again: When I say the word "space," what do you think of?

Have the children draw their ideas on paper. If possible, ask them to include one or more of the words from the alphabet cards as labels in their drawing. Then compare their first drawing with their second drawing. Look at how much you have learned about space! Great job! Gather up the drawings to bind into a group book or scan the drawings and email to families.

Ask open-ended questions while children participate in STEM play.

Ask children about their ideas and listen carefully.

Encourage children to engage with the materials and try out new ideas.

Ask children to discuss the learning event with each other.

Refer back to the STEM play and any data charts during the discussion.

Ask children to discuss what they learned about the topic.

Ask children to apply what they learned to new situations.

Redesign or rebuild incorporating what they learned.

Ask children what they learned about themselves and the STEM-literacy concepts covered.

HEALTHY SNACK

Star-Shaped Foods

Use a star-shaped cookie cutter to create star-shaped foods such as watermelon, sandwiches, etc. While eating, consider reading a book about Iowa astronaut, Peggy Whitson.

COMMUNITY-BUILDING

Rocket Relays

Have the children participate in various movement relays. For example, ask them to run as fast as rockets. Use as much vocabulary as you can from the book when playing the game.

CLOSING

Ask the children to share one thing that they learned today about space. Share any reminders with the group. Then pass out (or email) the 4-H Home Connections letter to help extend the learning and fun!

Home Connection

Remember to send home or email the 4-H Home Connections Letter to extend the learning and fun!

4-H CLOVER KIDS

DEAR CLOVER KIDS PARENTS AND GUARDIANS,

Today at Clover Kids, we learned about being an astronaut! Did you know that there are astronauts like Peggy Whitson who grew up in Iowa? We learned about space through fun and engaging activities such as:

- Reading *A is for Astronaut* by Clayton Anderson, ISU alumnus.
- Brainstorming ways to solve problems in space.
- Testing rockets and parachutes.

- Teamwork is an important part of every job!
- There are still many questions to answer about the universe.
- The Engineering Design Process can help create solutions to a problem.

AT HOME

Create and test a parachute at home with adult supervision.

1. Cut a circle out of a plastic bag or cotton cloth. The size is up to you, but bigger is often easier to work with!
2. Punch a minimum of four holes around the edge of the circle. If the plastic needs some reinforcement, place a piece of tape on the bag and then punch the hole.
3. Tie a piece of string to each hole; the pieces should be the same length.
4. Tie the strings together under the parachute, and then attach a figure.
5. Test your parachute out! See if you can get it to land on a target or come up with your own challenge.

DIG DEEPER

Visit NASA's Kids Club for great ideas and more information about space.

- https://www.nasa.gov/kidsclub/index.html

Check out more books from the library about space.

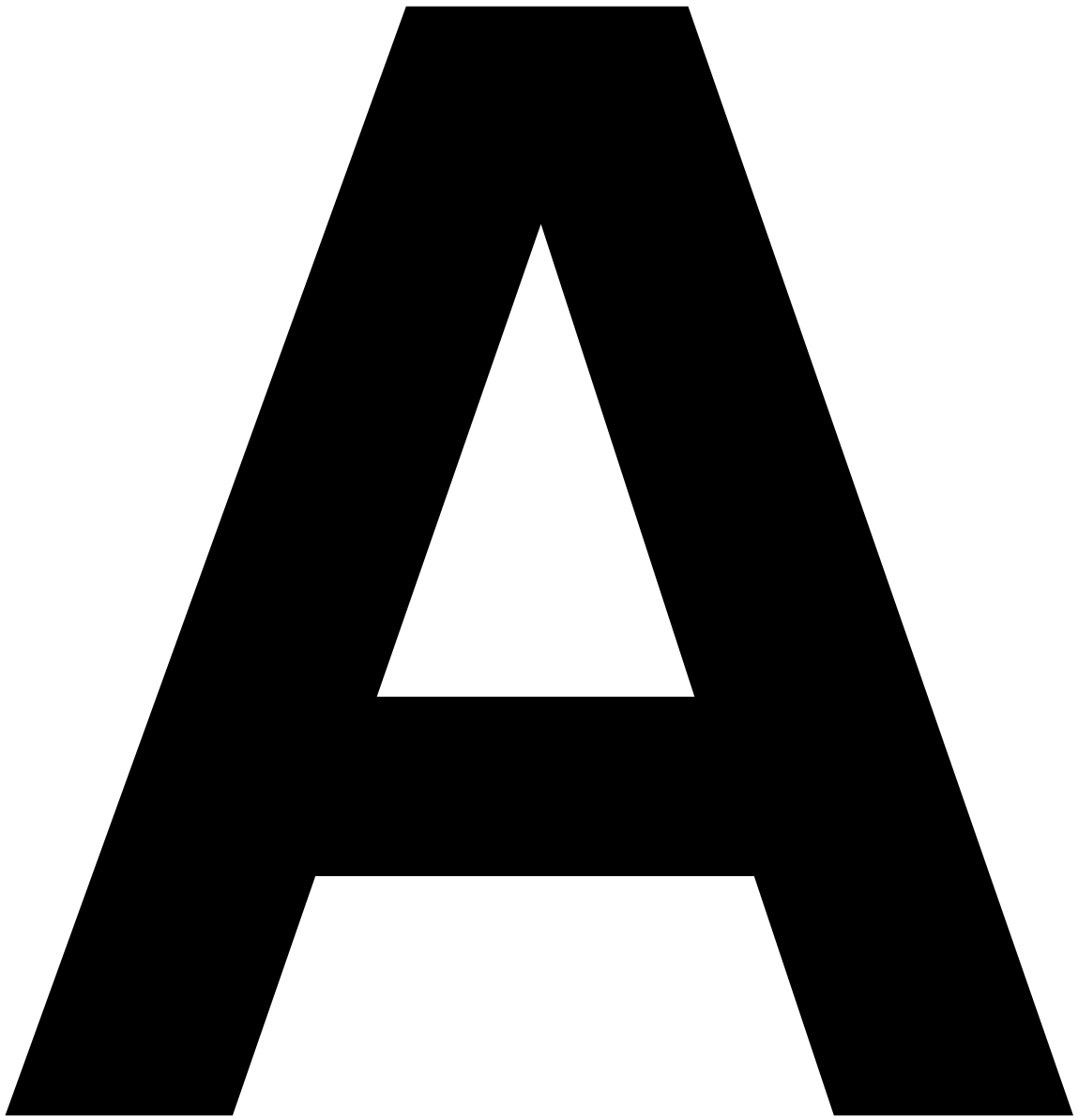
- *The First Space Missions* by Megan Cooley Peterson
- *Little Kids First Big Book of Space* by Catherine Hughes and David Aguilar

Thank you for being a part of Clover Kids today! We look forward to seeing you at our next meeting.

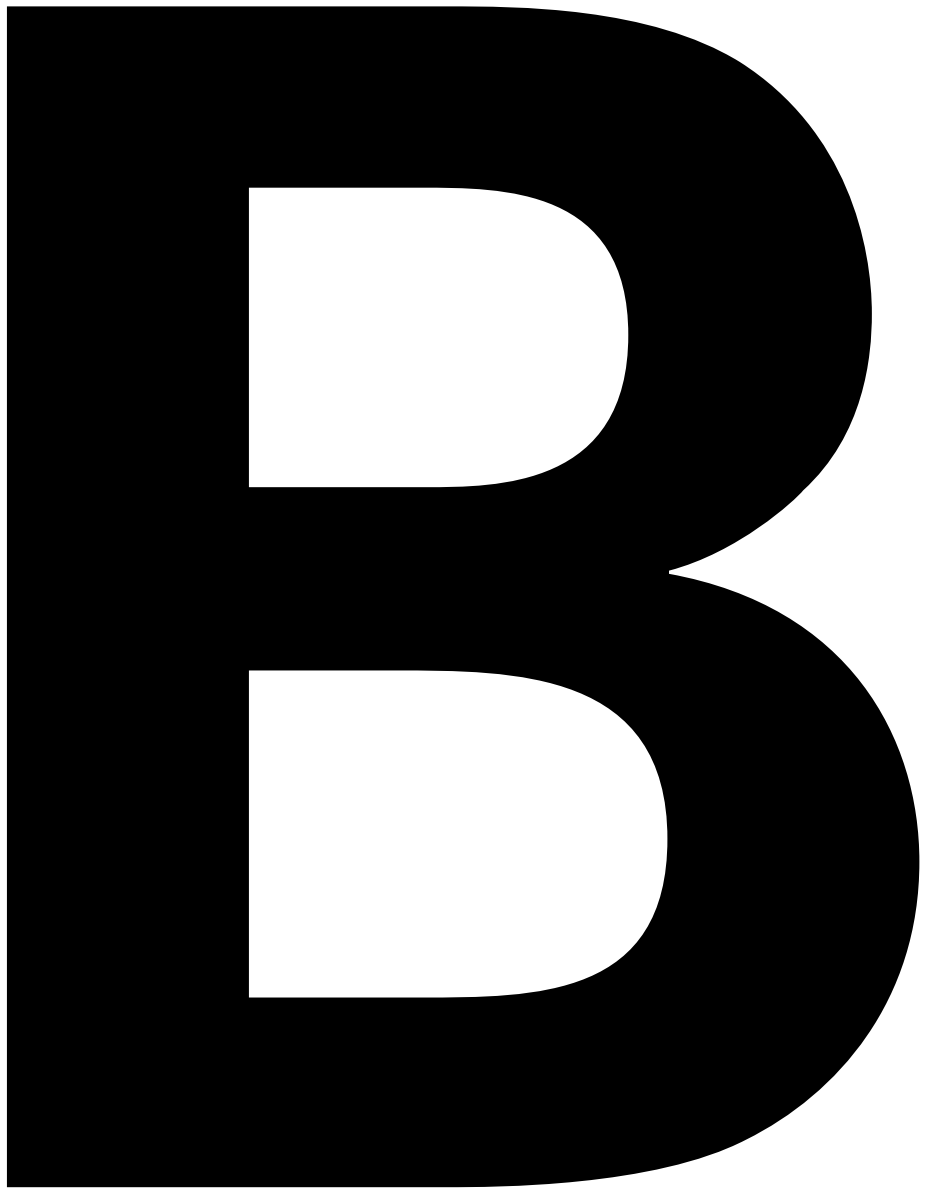
Sincerely,

Your Clover Kids Leader

IOWA STATE UNIVERSITY
Extension and Outreach

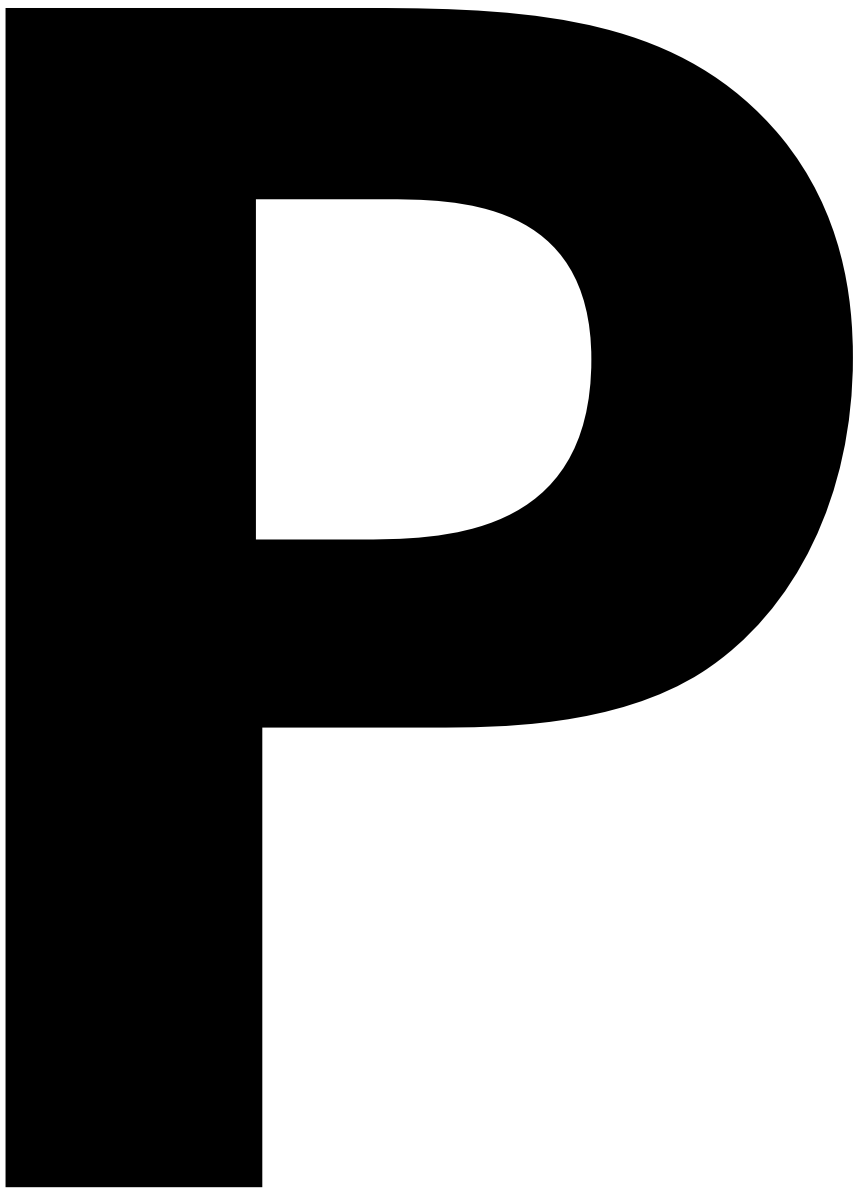


Astronaut

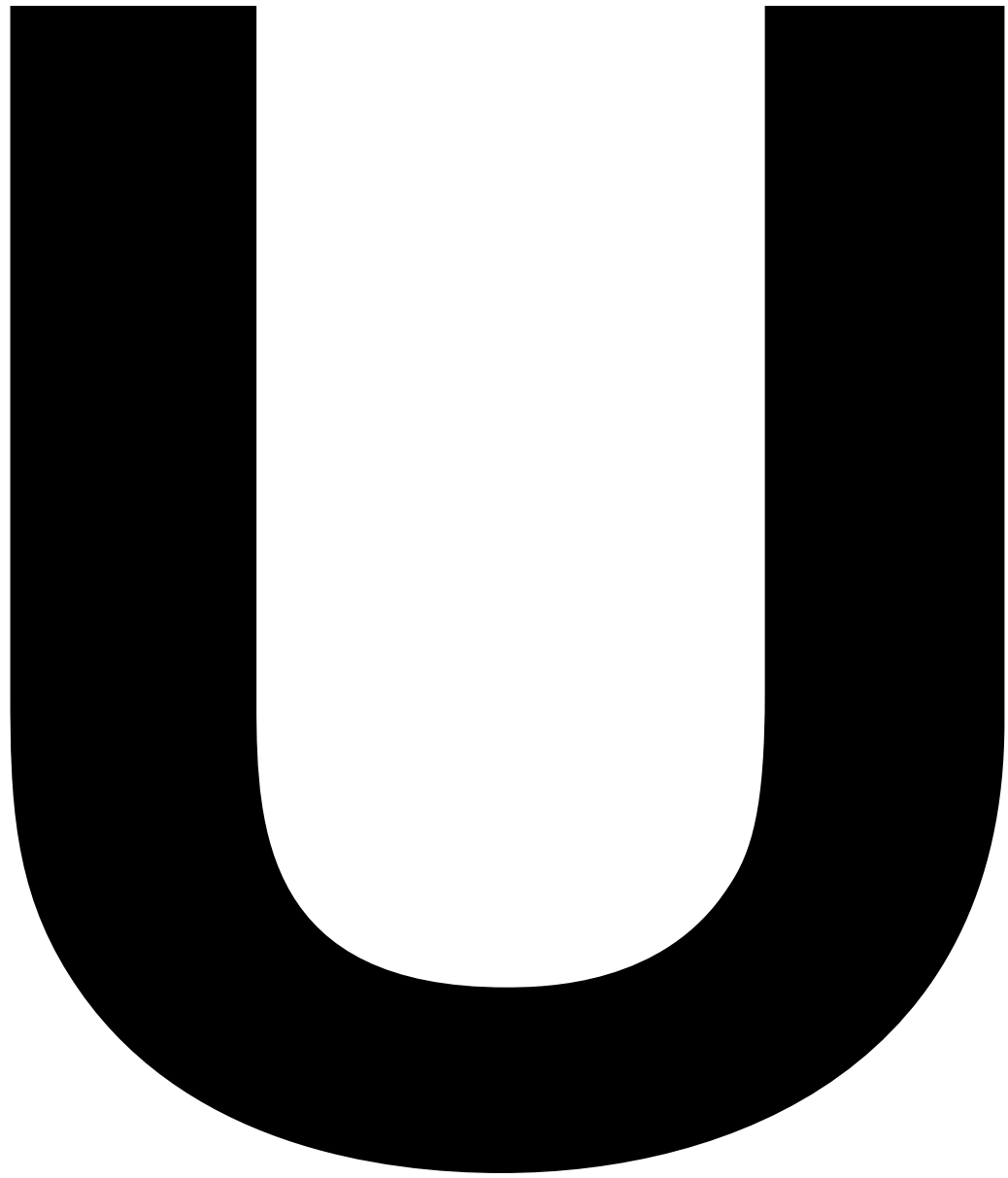


Blast Off

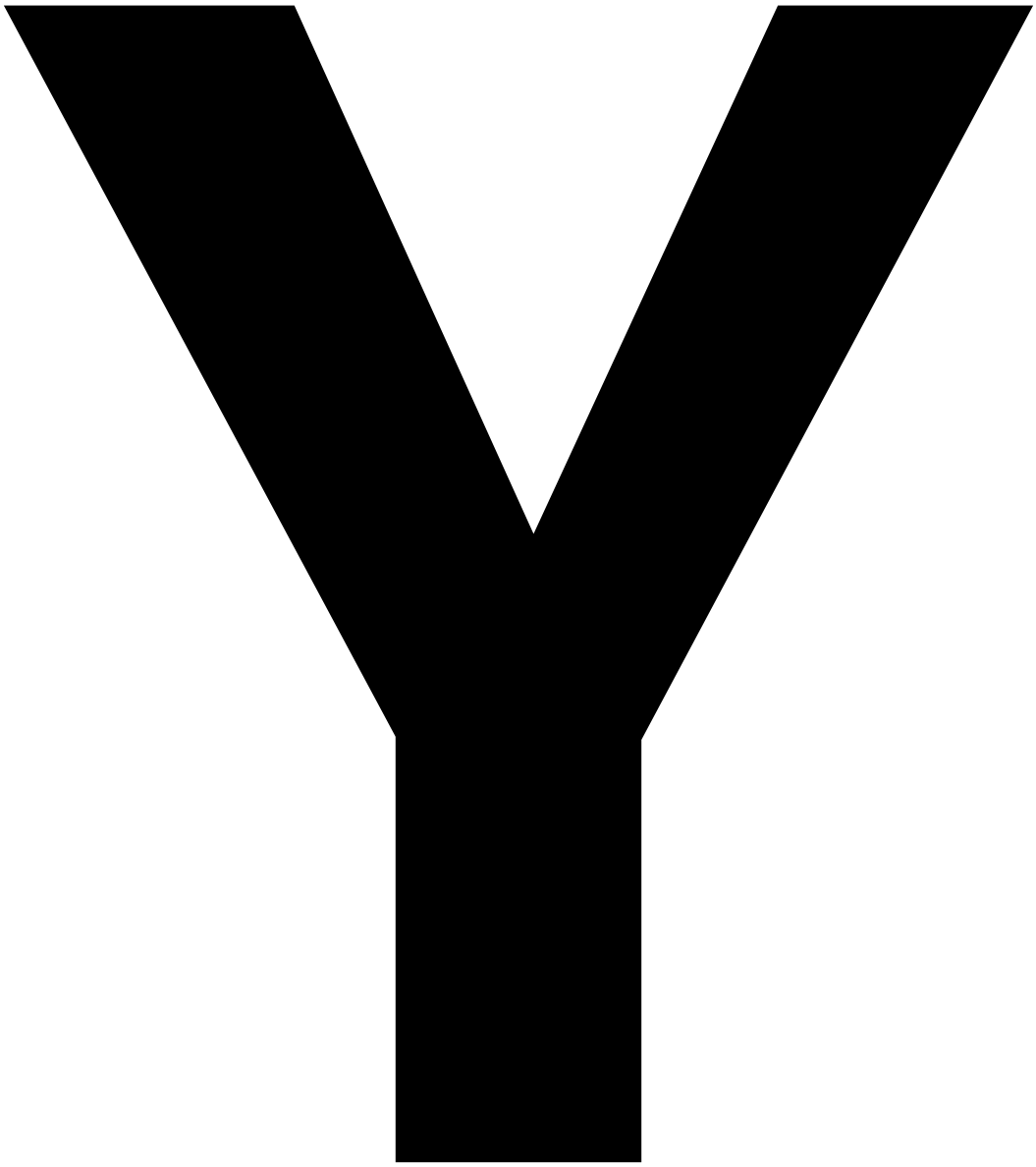
Landing



Planning



Universe



Yellow

BLAST OFF

ROCKET CHALLENGE

Remember to launch your rocket safely!

How high can you make your rocket go? Predict, launch, measure, record.

Direction:	Predict: How high do you think it will go?	Record: How high did it go?
		

What changes can you make to make it go higher? Write, measure, record, compare.

Direction:	Write: What changes did you make?	Record: How high did it go?
		

How far can you make your rocket go? Predict, launch, measure, record.

Direction:	Predict: How high do you think it will go?	Record: How high did it go?
		

What changes can you make to make it go farther? Write, measure, record, compare.

Direction:	Write: What changes did you make?	Record: How high did it go?
		

Come up with your own challenges!

CODE ACROSS IOWA

BIG idea

Children practice coding and problem-solving skills as they learn about Iowa.

AGENDA

Pledges and Announcements

STEM-Literacy Activity

- How Do I Get There from Here? Game
- Read Book *H is for Hawkeye* by Patricia A. Pierce
- Challenge: Code Across Iowa
- Read non-fiction text The World's First Electronic Digital Computer
- Read Book *Ada Lovelace, Poet of Science: The First Computer Programmer* by Diane Stanley
- Challenge: Solving for the Future
- Campanile Challenge

Healthy Snack: Yogurt Parfait

Community Building: Building Our Iowa Web

Closing: 4-H Home Connections Letter

KEY VOCABULARY

NAVIGATOR
a person who directs the route (normally used with transportation and done using a map)

PROGRAMMER
a person who creates computer programs

Materials

- ❑ Iowa Map
- ❑ *H is for Hawkeye: An Iowa Alphabet* by Patricia A. Pierce
- ❑ Pictures Representing Book Locations
- ❑ The World's First Electronic Digital Computer Text*
- ❑ Engineering Design Process Poster*
- ❑ Optional: *Ada Lovelace, Poet of Science: The First Computer Programmer* by Diane Stanley
- ❑ Paper
- ❑ Crayons/Markers/Colored Pencils
- ❑ Dash Materials (1/team): Dash Robot, Tablet, 8 ½ x 11 Signs of Iowa Places
- ❑ Bee-Bot Materials (1/team): Bee-Bot Robot, Bee-Bot Mat of Iowa Places
- ❑ Hexbug Nano Materials: Large Iowa Map (11x17) With Places Marked (1/team)
- ❑ Track Building Items: Empty Boxes, Straws, Tape (clear, masking, duct, etc.), Pipe Cleaners, Paper Cups, Heavy Paper, String/Yarn, Glue, Scissors

** Included with STEM-Lit TO GO!*

Healthy Snack Ingredients

- ❑ Yogurt
- ❑ Fruit
- ❑ Nuts
- ❑ Grains

PLEDGES AND ANNOUNCEMENTS

We encourage you to begin your Clover Kids meeting by reciting the Pledge of Allegiance, followed by the 4-H Pledge, when appropriate.

4-H Pledge

I pledge my head to
clearer thinking,
my heart to greater loyalty,
my hands to larger service,
and my health to
better living,
for my club, my community,
my country, and my world.

STEM-LITERACY ACTIVITY

How do I get there from here?

Before the meeting, decide on one location from the book *H is for Hawkeye* by Patricia A. Pierce to use for the game.

How do we get to (name of location)?

Show the children the sign for that location and place it in the center of the room.

Explain that when driving new places in a car, there should be a driver who is in charge of driving the car to the location. There is also a navigator who is in charge of telling the driver which direction to go in and how far. The navigator reads the map to tell the driver where to go.

Have children find a partner and a location somewhere in the room (not the center). The children will need to decide who will be the driver of the pair in the first round. The other child will be the navigator and must give clear and precise directions to direct the driver to the center of the room. The driver cannot move unless the navigator tells them. The navigator will follow behind the driver as they go across the room. Once they reach the center of the room, they can go to a new location in the room, switch roles, and try again.

Key Vocabulary

NAVIGATOR
a person who directs the route (normally used with transportation and done using a map)

What made being the driver easy? What was challenging about being the driver? What made being the navigator easy? What was challenging about being the navigator?

What's great about our state?

Have the children share their answers with you.

What are some places you have visited in Iowa? Do you know any famous places in Iowa? What is your favorite part about living in Iowa?

Explain that today they will be reading a book about the great state of Iowa.

READ ALOUD

Read the book *H is for Hawkeye: An Iowa Alphabet* by Patricia A. Pierce. Focus on the seven selected letters of the alphabet for the following activities. If there is extra time or interest, select additional letters.

BEFORE

Ask children what an alphabet book is.
Have them start to think of what parts of Iowa may be represented by the different letters. Explain that you will only be reading certain letters of the book.

DURING

Depending on the age and interest of the children, you might read the main text (rhyming portion) of the book and either summarize the factual information in the outer tab or only discuss those related to the next activity.

READ ALOUD

Read page A for American Gothic.

Has anyone seen this painting?

Did you know that the artist Grant Wood was born in Anamosa, Iowa, and that you can visit the house in the painting in Eldon, Iowa? Find Anamosa in Jones County on the large map of Iowa.

Read page F for Four-Leaf Clover.

Does anyone know what 4-H is?

Explain that as Clover Kids, they are in 4-H. When they are in 4th grade, they will be able to "graduate" into a 4-H club. There are two places on the Iowa map for F. Clarinda is in Page County and is the birthplace of Iowa 4-H. Clarion is in Wright County and is the birthplace of the 4-H Clover.

Read page L for Livestock.

Has anyone been around cattle, hogs, chickens, or sheep?

Explain that Iowa is number 1 in hog and in egg production. There are more hogs and chickens in Iowa than people! Iowa also ranks high in beef cattle, dairy, and sheep. Sioux County has more cattle than any other county in the state.

Read page R for River.

What river(s) is/are near us? What are the two rivers that make up the east and west borders of our state?

Explain that every July, there is a bicycle race, RAGBRAI, across Iowa that starts at the Missouri River and ends at the Mississippi River. It takes 7 days to ride across the state on RAGBRAI.

Read page T for Tractor.

What do tractors do? What is your favorite tractor brand?

Explain that John Froelich was the first person to build a one-cylinder tractor that could move forwards and backwards. Waterloo is where Mr. Froelich had his company and where John Deere still has factories.

Read page U for Universities.

What are the three state universities in Iowa? (Iowa State University, University of Iowa, and University of Northern Iowa.)

Explain that 4-H is part of Iowa State University Extension and Outreach which is part of Iowa State University in Ames.

Read page V for Villages.

Has anyone been to the Amana Colonies?

The Amana Colonies are in Iowa County.

AFTER

Ask children to share one thing they learned about Iowa with their neighbor. Then have the children share with the whole group. Encourage discussion by asking follow-up questions such as:

What was one new thing you learned about Iowa?

What makes Iowa great?

HANDS-ON STEM

Show the children a map of Iowa.

Where do you live?

Have the children locate their county. Using the map, help children locate places in the book.

Do

CHALLENGE

Explain to the children: The Iowa Tourism Board would like Iowans to visit more places around the state. Today we are going on a field trip to visit the places we learned about in the book! To practice giving directions, the children will program robots to get from their home county to the selected book locations.

Depending on the time allowed, choose a number of locations for the children to visit with their robots. Print or draw pictures to represent each of these locations. Clover Kids can be divided into teams of 2–4 children.

Option 1: If using Dash, create a "map" of Iowa on the floor of the room. Put 2–5 place signs in the proper locations of the room, based on their locations in Iowa. Place a sign labeled "home" in the correct location of the "map" for your home county. Explain to the children that their job is to drive Dash, using the Go app to the place signs and then back home. If the children are advanced programmers, they can use Blocky to accomplish this task.

Option 2: If using Bee-Bots, create a "map" of Iowa on the floor or Bee-Bot mat, using Bee-Bot-sized place signs. Put 2–5 place signs in the proper locations of the mat, based on their locations in Iowa. Place a sign labeled "home" in the correct location of the mat for your home county. Leave blank spaces, as necessary. Explain to the children that their job is to program the Bee-Bots to go to the place signs and then back home.

Option 3: If using the Hexbugs, print a small (11x17) "map" of Iowa. Help the children find their county and place a "home" sign. Explain to children that their job is to program the Hexbugs to go to the place signs and then back home. Please note that Hexbugs are only programmable by creating a path to follow. Give your Clover Kids various items such as empty boxes, straws, tape, pipe cleaners, paper cups, heavy paper, string/yarn, glue, etc. to create walls to guide their Hexbugs. This option will take more time.

Give the children time to program the robots to visit different locations across the state.

When done, have each team show their robot completing the program

What happened when you programmed your robots to visit different locations across Iowa?

How did you program your robot to go where you wanted?

Have different teams of children share things that went well and things that didn't go as planned. Discuss how they adapted their programming to be successful.

Reflect

How is programming a robot to "travel" across Iowa similar to planning a trip across Iowa?

When may you need to know how to give directions or even program a robot?

What did you learn about working in a group?

Apply

Helpful Hint

Depending on the size of the room, the number of Clover Kids members, and the availability of robots, you have three options for this activity.

Ask open-ended questions while children participate in STEM play.

Ask children about their ideas and listen carefully.

Encourage children to engage with the materials and try out new ideas.

Ask children to discuss the learning event with each other.

Refer back to the STEM play and any data charts during the discussion.

Ask children to discuss what they learned about the topic.

Ask children to apply what they learned to new situations.

Redesign or rebuild, incorporating what they learned.

Ask children what they learned about themselves and the STEM-literacy concepts covered.

READ ALOUD

Read non-fiction text The World's First Electronic Digital Computer. Depending on the time and interest of the children, you may want to tell the story in your own words, highlighting areas that relate to the children.

BEFORE **Ask: What do you think the first computer was like? Where do you think the first computer was made?**

DURING **Highlight the Iowa connections.**

AFTER **Ask children to share something they learned from the reading. Questions may include:**

Why do you think John Atanasoff needed help building the computer?
Why was Clifford Berry a good person to have help?
What did John Atanasoff and Clifford Berry do when they were young that helped them build the first electronic computer?
What do you think that you could do with what you are learning now in school and in Clover Kids?

HANDS-ON STEM

Show the children a map of Iowa.

What can you tell me about the engineering design process?

Show the Engineering Design Process poster. We are going to do the first two parts of the process to create a design for the future. John Atanasoff and Clifford Berry used their interest and knowledge to help them create the first electronic digital computer. What could you create?

Have the children start thinking of something that they are interested in and a problem that they have when they do it. Remind them that this is the Ask a Question/Identify a Problem phase of the Engineering Design Process. Maybe they like to play outside, but there are too many insects biting them. Could they create a better bug spray or a better way to keep from getting bit? Maybe they want to find a way to keep their room clean without having to do it.

Hand out paper and crayons/markers. Have the children start the Imagine process by drawing/writing out the problem and drawing/writing the solution.

Stress that what they are drawing or writing about is a design for a prototype that may not be able to actually be made for many years. Sometimes the Engineering Design Process takes years to complete, just like with John Atanasoff.

Have children share their problems and what solutions they came up with. Allow others to ask questions and give input into what may help the designs. Compare this discussion to discussions John Atanasoff and Clifford Berry might have had as they made the Atanasoff Berry Computer (ABC).

Optional

Read *Ada Lovelace, Poet of Science: The First Computer Programmer* by Diane Stanley

Before: What is a computer programmer?

During: Depending on time, you may want to summarize or even skip pages. Explain vocabulary as needed.

After: Ask: How did Ada's childhood likes help her write the computer program?

Key Vocabulary

PROGRAMMER
a person who creates computer programs

Ask open-ended questions while children participate in STEM play.

Ask children about their ideas and listen carefully.

Encourage children to engage with the materials and try out new ideas.

Ask children to discuss the learning event with each other.

Refer back to the STEM play and any data charts during the discussion.

Ask children to discuss what they learned about the topic.

HANDS-ON STEM CONTINUED

When may you be able to create and test your solution?

Do you think that adults ever have to wait to find the solutions to their problems?

What other problems are out there that you may have the ability to solve in the future?

What do you need to learn about to help solve those problems?

Apply

Ask children to apply what they learned to new situations.

Redesign or rebuild, incorporating what they learned.

Ask children what they learned about themselves and the STEM-literacy concepts covered.

Extend the experience: Have the children start to build a prototype of their designs, using a variety of available materials. A community partner could also be used to help build a prototype.

HEALTHY SNACK

Iowa Parfait

Use the Yogurt Parfait Recipe from Spend Smart, Eat Smart (https://spendsmart.extension.iastate.edu/recipe/yogurt-parfaits/), to create a snack with Iowa ingredients. Use yogurt and add local toppings such as fruits (apples, apricots, blueberries, cherries, grapes, peaches, pears, plums, raspberries, rhubarb, strawberries, and watermelons), nuts (walnuts and hickory nuts), and grains (Quaker cereals).

COMMUNITY-BUILDING

Building Our Iowa Web

Have the Clover Kids stand in a circle. Explain that they are going to create a web of yarn connecting all of them together in an alphabet story about Iowa. Each child will be adding to the story as well as assisting in creating a web similar to a spider web.

Start out by saying, "A is for Iowa ____," filling in the blank with something you like or know about Iowa that starts with the letter a. Then gently toss the yarn ball to a Clover Kid in the circle not directly next to you. Make sure you hang on to the end of the yarn ball. Then that child gets to add to the story by saying, "B is for Iowa ____," and add to the web by tossing the yarn ball. Make sure that each child keeps ahold of a piece of yarn to keep making the web. If someone needs help with ideas for a letter, ask first, and then allow others to assist. Once everyone has had a turn, you can either stop the game or keep going until you reach the end of the alphabet.

Once done, slowly lower the web of yarn to the floor and check out the pattern they have made. You can talk about how the web shows how everyone is connected to the group and to Iowa. Take a photo to share with parents/guardians!

Helpful Hint

If working with younger children, have them share one thing they like about Iowa, and then pass the yarn ball. The word doesn't need to start with a certain letter.

CLOSING

Ask children to share one thing that they learned today about Iowa, coding, or computer science. Share any reminders with the group.

Home Connection

Remember to send home or email the 4-H Home Connections Letter to extend the learning and fun!

4-H CLOVER KIDS

DEAR CLOVER KIDS PARENTS AND GUARDIANS,

Today at Clover Kids, we learned about Iowa and coding! Did you know that Iowa has many interesting places? We learned about Iowa and coding through fun and engaging activities such as:

- Reading H is for Hawkeye by Patricia A. Pierce.
- Coding a robot to visit various great locations in Iowa.
- Imagining a solution for a current problem, even if they can't solve it now.

- Iowa has many interesting and unique places to visit!
- Coding involves giving clear and precise directions.
- The world's first electronic digital computer was designed and built at Iowa State University by John Vincent Atanasoff and Clifford Berry.

AT HOME

- Practice giving and following directions as if you were programming a robot.
- Read Numbers in a Row: An Iowa Number Book by Patricia A. Pierce to learn about more great places in Iowa.
- Work together to figure out a solution for a problem that your child has.

DIG DEEPER

- Visit Travel Iowa (https://www.traveliowa.com/) and plan a trip to a new place in Iowa. Have your child help you plan the trip—including choosing a place to visit, deciding on the roads you will take, and deciding where to stay.
- Check out more books from the library about Iowa.
  - *What's Great about Iowa?* by Kristin Marciniak
  - *I is for Iowa* by Mary Ann Gensicke
  - *I is for Iowa People* by Mary Ann Gensicke

Thank you for being a part of Clover Kids today! We look forward to seeing you at our next meeting.

Sincerely,

Your Clover Kids Leader

IOWA STATE UNIVERSITY
Extension and Outreach

The World's First Electronic Digital Computer

The world's first electronic digital computer was built by John Vincent Atanasoff and Clifford Berry in Ames, Iowa.

John Vincent Atanasoff was born in Hamilton, New York. His father was an immigrant from Bulgaria. His mother and father helped him learn about many things-including how electrical circuits and farm machines worked. He moved to Ames, Iowa to teach mathematics classes at Iowa State College (now Iowa State University) and to work on his master's degree. After a few years, he became a professor of mathematics and physics at Iowa State College. John loved math. He enjoyed solving difficult math problems. When he solved math problems, he thought that there had to be a machine to do it. Since there wasn't a machine invented yet, could he create one?

Clifford Berry grew up in Gladbrook, Iowa. Clifford learned about electronics from his father, who owned an electrical appliance repair store. When he was 11, the family moved to Marengo, Iowa. Clifford graduated from Iowa State College (now Iowa State University) with a degree in electronic engineering in 1939 and started working on a master's degree in physics.

In 1937, after many years of trying to figure out how to create a math problem solving machine, John Vincent Atanasoff came up with the draft of a plan to create the world's first electronic digital computer. He knew that he didn't have all of the skills and knowledge to build the computer all by himself. He asked other professors if they knew of a student who could assist him. Clifford Berry was suggested for the job.

John Atanasoff and Clifford Berry worked for two years, (1939-1941), to build the first electronic digital computer. They only had $650 to spend. They called the computer the Atanasoff-Berry Computer (ABC). The ABC was as large as a big desk, weighed 750 pounds, and featured rotating drums for memory, glowing vacuum tubes, and a read/write system that recorded numbers by scorching marks on cards.

The ABC was the first machine to use ideas that are used in our computers today. These parts include: "A Binary System of Arithmetic, Separate Memory and Computing Functions, Regenerative Memory, Parallel Processing, Electronic Amplifiers as on-off Switches, Circuits for Logical Addition and Subtraction, Clocked Control of Electronic Operations, and A Modular Design." (https://www.ece.iastate.edu/the-department/history/history-of-computing/)

John Atanasoff and Clifford Berry used their knowledge of science, technology, engineering, and mathematics to design, create, and build the world's first electronic computer. Their hard work and ability to work together as partners gave us today's computers, tablets, phone, and smart watches.

References:

History of Computing. https://www.ece.iastate.edu/the-department/history/history-of-computing/. Retrieved May 15, 2018.

John Vincent Atanasoff and the Birth of Electronic Digital Computing. http://jva.cs.iastate.edu/jvabio.php. Retrieved May 15, 2018.

Clifford Berry Co-Inventor of the World's First Electronic Digital Computer https://www.ece.iastate.edu/profiles/clifford-berry/. Retrieved May 15, 2018.

HOUR AT THE FAIR

STEM-Lit TO GO! iowa

BIG idea

Children participate in a variety of STEM-literacy activities while learning more about the Iowa State Fair.

AGENDA

Pledges and Announcements

STEM-Literacy Activity

Read book County Fair by Laura Ingalls Wilder

Compare Past and Present Fairs

Participate in Fair Stations

- Art Challenge
- Animal Challenge
- Bee (Bee-Bot) Challenge

Discuss and Learn More About the Fair

Healthy Snack: Snacks on a Stick, Vote For Favorite

Community Building: Clothing Design Challenge

Closing: 4-H Home Connections Letter

KEY VOCABULARY

PAST
having existed or happened in a time before now

PRESENT
not past or future: existing or happening now

FUTURE
the period of time that will come after the present time

Materials

- ❑ Materials Showcasing Past/Present Fair
- ❑ Book County Fair by Laura Ingalls Wilder
- ❑ Video Access/Player (Optional)
- ❑ Chart Paper/Marker
- ❑ Animal Matching Cards
- ❑ Index Cards/Markers
- ❑ Flower and Hive Images*
- ❑ Bee-Bots (Optional)
- ❑ Book Explore My World: Honey Bees by Jill Esbaum

Art Design Challenge:

- ❑ Plastic/Cloth Bag (1/Child)
- ❑ Bag Material Ideas: Paper, Glue, Markers, Crayons, Pipe Cleaners, Tissue Paper, Scissors

Clothing Design Challenge:

- ❑ Paper Bag, 1/Group with Theme Written on Bag
  - Theme Ideas: Sports, Restaurant, Medical, School, Farm, Etc.
  - Bag Material Ideas: Pieces of Reusable Cloth, Accessories, Capes, Tin Foil, Yarn, Clothespins, Etc.
- ❑ Optional: Magazines, Scissors, Glue

** Included with STEM-Lit TO GO!*

Healthy Snack Ingredients

- ❑ Apples, Berries, Veggies
- ❑ Cheese
- ❑ Toothpicks

PLEDGES AND ANNOUNCEMENTS

We encourage you to begin your Clover Kids meeting by reciting the Pledge of Allegiance, followed by the 4-H Pledge, when appropriate.

STEM-LITERACY ACTIVITY

Share that today we are going to be learning about the Iowa State Fair. The Iowa State Fair is over 125 years old and has been enjoyed by many Iowans! To learn more about the fair, we are going to look at how the fair has changed over the years.

READ ALOUD

First, let's look at fairs from the past. Share the definition of the word "past" with the children. Read the book *County Fair* by Laura Ingalls Wilder.

BEFORE

Ask the children to look at the cover and predict what the book is going to be about.
Use the title and the illustrations to help make the predictions.
What do you think fairs in the past were like?
Let's read to find out more.

DURING

Point out or explain how some things were different in the past.
For example, the family takes a horse-drawn buggy to get to the fair.

AFTER

Discuss the book with the children. Here are a few sample questions:
What things did you find interesting about this book?
Did anything surprise you?
What were some things you learned about fairs from the past?

Share additional photos and/or books that highlight fairs from the past with the children.

Hold a discussion on past Iowa State Fairs at the conclusion of the activities chosen. Then draw two columns on a piece of chart paper. Label one column "past" and the other column "present." Share the definition of the word "present" with the children. Write down their ideas and thoughts about past fairs in the left-hand column.

Past	Present

Next, repeat the process but focus on today's fair. Share photos, videos, or articles that highlight the present-day fair with the children.

Examples of activities that showcase the fair today:

1. Examine photos of the State Fair from a newspaper or the Iowa State Fair website. Here is one example: https://www.iowastatefair.org/media/image-library/
2. Watch the Iowa State Fair video: https://www.youtube.com/watch?v=6WMh-3_hoS8
3. Ask a current 4-H member to speak to your Clover Kids group.

Hold a discussion on the present-day Iowa State Fair at the conclusion of the activities chosen. Write down the children's ideas and thoughts about our current fair in the right-hand column. Compare the two columns. How are they the same? How are they different? What has changed about the fair?

4-H Pledge

I pledge my head to clearer thinking, my heart to greater loyalty, my hands to larger service, and my health to better living, for my club, my community, my country, and my world.

Helpful Hint

This may be a great time to work in materials from past Iowa 4-H members or items from a local historical museum.

Examples of additional activities that showcase past fairs include:

1. Examine photos from past Iowa State Fairs. Here are some examples: https://www.desmoinesregister.com/picture-gallery/news/2015/06/11/36-historic-photos-iowa-state-fair-through-the-years/71087528/

2. Ask the group to bring family photos from past Iowa State Fairs.

3. Ask parents/guardians or grandparents to speak about past Iowa State Fairs.

Key Vocabulary

PAST
having existed or happened in a time before now

PRESENT
not past or future: existing or happening now

HANDS-ON STEM

Now that we have learned a little more about the fair and how it has changed over the years, let's take a look at some of the wonderful projects that 4-Hers can currently do at the Iowa State Fair!

Do

Share with the children that they will now be taking part in their own fair. Introduce the stations for the children to rotate through or move as a group from one to the next.

- Mention that the topics we are working with today are some of the project areas 4-H members can create exhibits on at the Iowa State Fair. As you finish each activity, note the project area and its tie to the Iowa State Fair.

Helpful Hint

For a complete list of Iowa 4-H project areas visit: https://www.extension.iastate.edu/4h/projects-list

Ask open-ended questions while children participate in STEM play.

Ask children about their ideas and listen carefully.

Encourage children to engage with the materials and try out new ideas.

CHALLENGES

Activity 1: Art Design Challenge

Hand out an art design material bag to each child or group. Ask the children to create a piece of art out of the materials provided. Leave the activity very open-ended or suggest an art idea to the group. For example, design a picture of a clover or art that represents Clover Kids. Create an art gallery in the room for children to display their art when done. Ask each child or group to present their art.

Tie: Creative Arts 4-H Project Area

Activity 2: Animal Challenge

Introduce the animal cards to the children. Animal picture cards can be found at: https://cdn.agclassroom.org/media/uploads/LP81/Animal_Cards.pdf?fbclid=IwAR0qubA-_Rmiizc3QIgR0n6sp_NFP0cxQbju57KIp_tGOtElhQEeqwLm5Dw
Be sure to share that in 4th grade, 4-H members are able to show a variety of animals at the fair. The cards can be used to (1) play a game of Memory or (2) hand out the cards and ask children to find their match.

Once children are familiar with the animals, try doing some creative dramatics or movement. Encourage the children to move around the room like the animal you are holding up. As you hold up the animal, check to see if the group can remember the correct name!

Tie: Animals 4-H Project Area

Activity 3: Bee Challenge

READ ALOUD

Read the book *Explore My World: Honey Bees* by Jill Esbaum

BEFORE **Ask children to share what they know about bees.** Then introduce the non-fiction book to the children.

DURING **Share how to read the captions that are to the side of the main text.** Point out how the captions can add fun details or help you understand new words when reading. Note for the group how non-fiction books often have this text feature.

AFTER **Ask children to help you summarize the book.** What are the main ideas that the author would like for you to remember?

CHALLENGES CONTINUED

Introduce the Bee-Bot to the children and model how they work. Allow time for play with the Bee-Bot. Can you make it go forward, left, and right? See the instructions for help.

After time for play, set out the flower and hive photos on the floor. Share that just like the book mentioned, we are going to have our bees go from the flower to the hive. Program the Bee-Bot to go from the flower to the hive. To make it more challenging, add some obstacles that the Bee-Bot will need to go around!

Unplugged activity: Have the children "program" each other to get from the hive to the flower by creating coding cards with index cards and markers. Write out step-by-step directions for getting to the flower. Then have a child follow the directions on the cards. Did they get to the flower? Remember, only one direction per card!

Discuss both the coding and bee concepts with the children. What went well with the coding? What was challenging? What did you learn about bees? Why are they important to us? How do they impact our daily lives?

Tie: Agriculture and Natural Resources & Science, Engineering, and Technology 4-H Project Areas

Hold a group discussion to reflect on the activities.

Reflect

- Which activity was your favorite? Why?
- How did you make your decisions in the art project or coding project?
- What skills did you practice in the activities?
- What did you learn about art, animals, bees, or coding (pick one)?
- How has the fair changed over the years (reference the chart here)?
- What do you think fairs will look like in the future? Share the definition of the word "future" with the children.

Apply

Ask children to apply what they learned to new situations.

Redesign or rebuild incorporating what they learned.

Ask children what they learned about themselves and the STEM-literacy concepts covered.

Key Vocabulary

FUTURE
the period of time that will come after the present time

Ask children to discuss the learning event with each other.

Refer back to the STEM play and any data charts during the discussion.

Ask children to discuss what they learned about the topic.

COMMUNITY-BUILDING

Clothing Design Challenge

Take part in the five-minute clothing design challenge! Break the children into teams of 3–4. Then place the challenge bags in front of the children. Read the labels written on the bags and explain the directions. Then ask each group to create an outfit from the provided materials that fits with the theme written on the outside of their bag. For example, if you read the bag with the word sports on it, share with the children that they must create a sport outfit with the materials provided—in five minutes! (The time can be lengthened if needed.) Host a fashion show at the end of the five-minute challenge.

Tie: Family and Consumer Sciences 4-H Project Area

Optional

The five-minute challenge could also be done on a stuffed animal such as a teddy bear or by cutting out pictures of clothing from magazines. For both options, have the children create an outfit that fits an assigned theme. Draw conclusions based on the information collected.

HEALTHY SNACK

Conduct a taste test of different varieties of a type of food (ex: apples, berries, veggies, cheeses). Number the items and vote for a favorite. In honor of the Iowa State Fair, the snacks could go on a stick (toothpick).

Tie: Family and Consumer Science & Agriculture and Natural Resources

CLOSING

Ask children to share one thing that they learned today about the Iowa State Fair and/or 4-H. Share any reminders with the group.

Home Connection

Remember to send home or email the 4-H Home Connections Letter to extend the learning and fun!

4-H CLOVER KIDS

DEAR CLOVER KIDS PARENTS AND GUARDIANS,

Today at Clover Kids, we learned more about 4-H and the Iowa State Fair! Did you know that the first Iowa State Fair was held October 25–27, 1854, in Fairfield? Clover Kids learned about the Iowa State Fair through fun and engaging activities such as:

- Viewing a video about the Iowa State Fair.
- Participating in fair stations that featured topics such as visual arts, horticulture, and robotics.
- Presenting a fashion show!

- There are lots of ways to participate in the Iowa State Fair.
- The fair has changed in many ways over the years.
- Fairs are a great way to have fun and celebrate our state!

AT HOME

- Explore the 4-H project area list. Click on one that looks interesting to you! https://www.extension.iastate.edu/4h/projects-list
- Check your local library to see if there may be other books about the fair you can check out! One book is Night at the Fair by Donald Crews.
- Set up your own fair at home. Ideas may include: the midway (ring toss and other fun games), the exhibit halls (display your artwork or food creations), and a talent show. We would love to see photos of your family-fun fair.

DIG DEEPER

- Learn more about the Iowa State Fair by visiting: https://www.iowastatefair.org/
- Visit the Iowa State Fair Museum. Here is a site for more information: https://www.iowastatefair.org/about/history-museum/
- Visit the Iowa State Fair in August to learn even more!

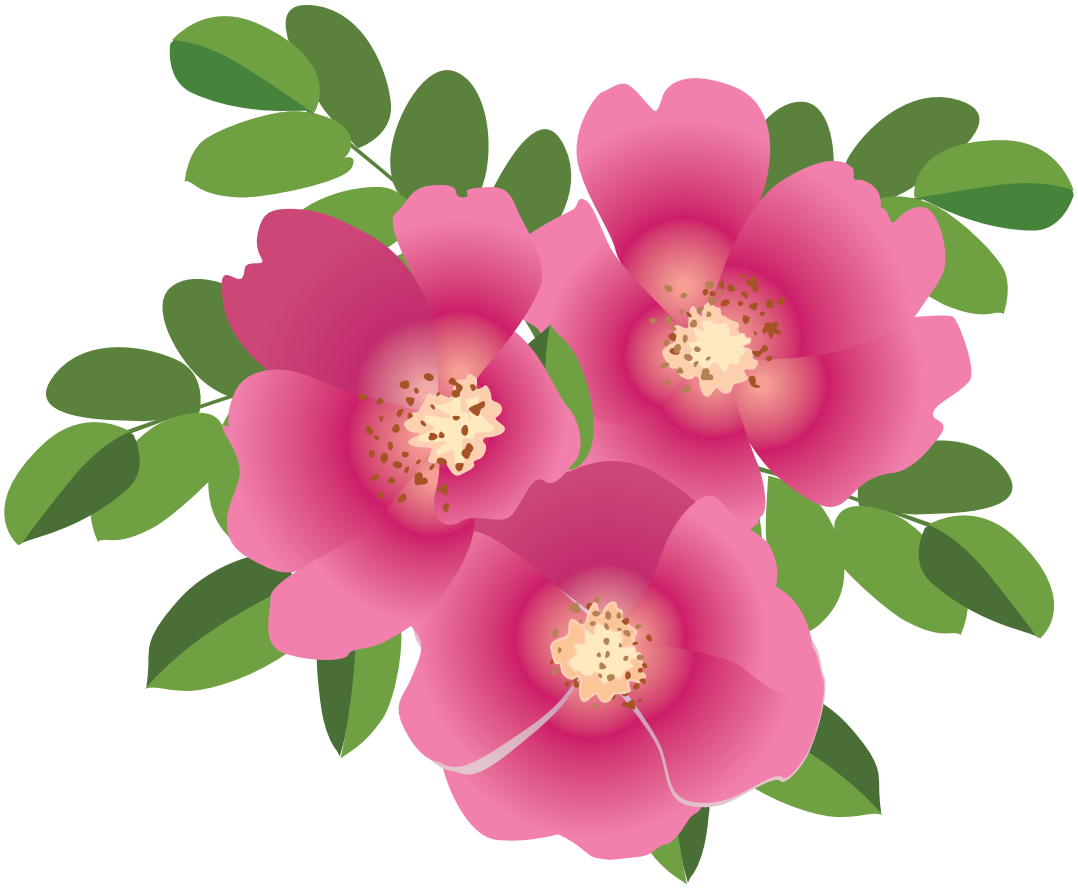
Thank you for being a part of Clover Kids today! We look forward to seeing you at our next meeting.

Sincerely,

Your Clover Kids Leader

IOWA STATE UNIVERSITY
Extension and Outreach

FLOWER AND HIVE IMAGES



MARVELOUS MARSHMALLOWS

BIG idea

Children learn about an Iowa connection to a famous marshmallow treat, conduct marshmallow investigations, and launch marshmallows at a target to learn more about STEM process skills.

AGENDA

Pledges and Announcements

STEM-Literacy Activity

Marshmallow Vote

Read book A Camping Spree with Mr. Magee by Chris Van Dusen

STEM Challenge: Launch Marshmallows into Mr. Bear's Mouth

Read Push and Pull by Patricia J. Murphy

Continued STEM-Literacy Activity

Read Blurb on Mildred Day

Marshmallow Investigations and Cooking: Physical and Chemical Changes

Read book All About Matter by Mari Schuh

Healthy Snack: Crispy Rice Treats and Milk

Community Building: Marshmallow Games

Closing: 4-H Home Connections Letter

*This meeting agenda contains multiple learning experiences; you may need to reduce the number of activities or complete in multiple sessions.

KEY VOCABULARY

PREDICTION
using knowledge and personal experiences to anticipate what might happen next

FORCE
a push or a pull

BIOGRAPHY
a written history or story about a person's life

MATTER
has three forms: solid, liquid, or gas; everything that takes up space and has mass

Materials

- ❑ Sticky Notes
- ❑ Chart Paper/Marker
- ❑ Book A Camping Spree with Mr. Magee by Chris Van Dusen
- ❑ Mr. Bear Letter*
- ❑ Marshmallow Launchers: Paper Cup, 12" Balloon, Duct Tape (1/Group)
- ❑ Mini-Marshmallows (Small Bag/Group)
- ❑ Measuring Tapes
- ❑ Mr. Bear Target (Ex: Plastic Bin or Hula-Hoop)
- ❑ Book Push and Pull by Patricia J. Murphy
- ❑ Mildred Day Biography
- ❑ Crispy Rice Treat Recipe (Written on Chart Paper)
- ❑ Ingredients and Cookware for Treats
- ❑ Book All About Matter by Mari Schuh
- ❑ Marshmallow Game Materials: Marshmallows, Tic-Tac-Toe Sheets*, Toothpicks

** Included with STEM-Lit TO GO!*

Healthy Snack Ingredients

- ❑ Butter
- ❑ Marshmallows
- ❑ Crispy Rice Cereal

PLEDGES AND ANNOUNCEMENTS

We encourage you to begin your Clover Kids meeting by reciting the Pledge of Allegiance, followed by the 4-H Pledge, when appropriate.

4-H Pledge

I pledge my head to clearer thinking, my heart to greater loyalty, my hands to larger service, and my health to better living, for my club, my community, my country, and my world.

STEM-LITERACY ACTIVITY

Write the question, "Do you like marshmallows?" on the top of the chart paper.

Read the title with the group. Be sure to point to the words as you read them.

Next, ask each child to place a sticky note under the words yes or no in response to the question.

Count the number of yes and no votes and write the total number at the bottom of the chart. Discuss the results as a group.

Do you like marshmallows?	
Yes	**No**
Total #	**Total #**

Which group is larger?
Why do you think that group is larger?
How many voted (add numbers together)?

Do a lot of us love (or not like) marshmallows?
Why do you think we feel that way?

Key Vocabulary

PREDICTION
using knowledge and personal experiences to anticipate what might happen next

READ ALOUD

Read the book *A Camping Spree with Mr. Magee* by Chris Van Dusen.

BEFORE

Share that next we are going to read a book about an animal that LOVES marshmallows.
Does anyone have a guess as to what that animal might be?
Let's predict which animal we think may LOVE marshmallows in this book. Remember that a prediction is what you think will happen. Encourage children to guess an animal and ask them why they picked that animal. Let's read to find out which animal LOVES marshmallows!

DURING

Read the book in a rhythmic manner.
At times, pause to see if the children can guess what rhyming word is coming up next. Here's an example from page two of the book: "There's nothing like camping," said Mr. Magee. "I know you will love it. Just you wait and ___." Pause and see if the children can supply the rhyming word "see."
On page four of the book, the bear appears. Be sure to reference back to the original prediction question about what type of animal may LOVE marshmallows.
On page 10, the bear mistakes the camper hitch for a marshmallow. Ask children to predict what they think is going to happen. Read to find out what happens!

READ ALOUD CONTINUED

AFTER

Discuss the book with the children. Discussion questions may include:

Were our animal predictions correct?

Have you ever been camping? If so, how was it different or the same as the book?

Do you think you also would have decided to just camp in the backyard? Why or why not?

Take a short movement break after the book.

Who were the three main characters in the book? They are Mr. Magee, Bear, and the little dog, Dee. Call out the name of a character and have the children move around and act like that character.

HANDS-ON STEM

Gather the children back together. Share that a letter came for the group—I wonder who it is from? Read the return address. It's from Mr. Bear! Read the following letter to the group.

Mr. Bear
High on Hill Lane
The Forest, 00000

Name of Your Group
Your Address

Dear [Group],

I hope that you are having a good day! My day is not going so well. I ran out of marvelous marshmallows and really miss their yummy taste. Would you be willing to launch some marshmallows over the trees to me—please? I will be waiting patiently in the forest for your response.

Your hungry friend,

Mr. Bear

P.S. It would be wonderful if you could please launch those yummy treats right into my mouth.

Hand out premade marshmallow launchers or build as a group. Directions on how to make the launcher are included below. If needed, videos on how to make these can be found online.

1. Cut off the bottom portion of a disposable plastic or firm paper cup.
2. Tie a knot in the bottom of a balloon (do not fill the balloon with air). Snip the top of a balloon off, then stretch the top of the balloon over the bottom of the cup. Be sure that the knot is inside the cup. This is what will be pulled to launch the marshmallow later.
3. Place tape around the cut edges of the balloon, securing it to the cup. This will make it more durable and prevent the balloon from snapping off while being used.

Do

Ask open-ended questions while children participate in STEM play.

Ask children about their ideas and listen carefully.

Encourage children to engage with the materials and try out new ideas.

Helpful Hint

Be sure to model how to safely use the launchers. Then have the group take some time to play with the launchers and learn more about them.

HANDS-ON STEM CONTINUED

Next, share the Marshmallow Launcher Challenge with the group. Hold up the Mr. Bear target (ex: plastic bin or hula-hoop with bear ears) as you explain the challenge to the children. Measure out two feet or more from the target with the group. Then have the children work to get the marshmallows into Mr. Bear's mouth.

Can you figure out a way to get a marshmallow into Mr. Bear's mouth? Try getting the marshmallow into Mr. Bear's mouth by changing two things (1) how far away from Mr. Bear you are and (2) the angle of your launcher (aiming high, low, or in the middle). Remember that we can't get too close to Mr. Bear's mouth—we need to be at least two feet away for safety, of course!

When done, hold a group discussion about what worked and what didn't.

Reflect

Apply

Ask the children to refer back to the experience when sharing what worked and what didn't. Possible questions to ask include:

What distance and/or angle seemed to be the most successful? Or worked best? Can you show the group?

Can you think of examples in your life where something is launched? (rockets, slingshots)

Is it a good idea to feed marshmallows to bears? (no)

Was math an important part of this process? How so? (yes, it helps determine the most effective way)

Do you have a favorite moment from the activity?

READ ALOUD

Read book Push and Pull (Rookie Reader) to answer any questions about force.

BEFORE What questions do you have about force? Or about something from the activity?

DURING Read the book looking for answers to the children's questions and tie the concepts to the experience.

AFTER Hold a discussion on the book. How did the book tie to our marshmallow launching? Did you learn anything new about force? Where else do you see pushes and pulls in your life?

Working with these marvelous marshmallows has made me kind of hungry—and interested in learning more about marshmallows. So we now have some more fun things to do with marshmallows!

Read blurb on Mildred Day (Iowa Connection)

Here is a link to her story: https://www.housing.iastate.edu/halls/geoffroy/day/

BEFORE **Ask the children if anyone has heard of Mildred Day?** Share that you will be reading a story about Mildred Day's life. A story about someone's life is called a biography. Ask the children to listen closely for details about Mildred Day's life.

DURING **Be sure to highlight that Mildred was from Iowa and her role in making Rice Krispy Treats.**

Helpful Hint

Change the target size or distance from the target as needed for the group. For example, make the target area bigger if getting the marshmallow into the mouth is tricky. Also, mix in more math by measuring out various distances from the target to test.

Key Vocabulary

FORCE
a push or a pull

Ask children to discuss the learning event with each other.

Refer back to the STEM play and any data charts during the discussion.

Ask children to discuss what they learned about the topic.

Ask children to apply what they learned to new situations.

Redesign or rebuild, incorporating what they learned.

Ask children what they learned about themselves and the STEM-literacy concepts covered.

READ ALOUD CONTINUED

AFTER **Ask the children to share one thing they learned from this biography with a neighbor. Then have the children share with the whole group. Encourage discussion by asking follow-up questions such as:**
What were the important parts of the story? (Determining importance)
Do you know anyone that has a job similar to Mildred's?

Bring out the chart paper with the recipe for crispy rice treats written on it. Discuss with the children how to read a recipe and show different measurement tools that are going to be used.

Key Vocabulary

BIOGRAPHY
a written history or story about a person's life

MATTER
has three forms: solid, liquid, or gas; everything that takes up space and has mass

HANDS-ON STEM

As a group, follow the recipe and make the treats.

Encourage the children to participate safely as much as possible.

Do

Ask children to observe what happens when you apply heat to the marshmallows (or the treat ingredients). Focus on cause and effect. For example, what caused the marshmallows to melt? Or what effect did the heat have on the marshmallows? Finish making the treats together and set aside to cool while you have a short discussion.

What happened when we applied heat to the marshmallows?

Reflect

Have each child draw a representation of the heating process.

Encourage the children to add simple labels to the drawing whenever possible.

Share each of the drawings. If wanted, a group drawing could be created.

Discuss any questions that the children may have about how or why the marshmallows changed while cooking.

Ask open-ended questions while children participate in STEM play.

Ask children about their ideas and listen carefully.

Encourage children to engage with the materials and try out new ideas.

READ ALOUD

Read the book All About Matter to the group, while eating your snack, to answer possible questions or to review concepts.

BEFORE **Ask the children to listen for anything that they think might help explain what happened when we made our treats or for information that may help answer our questions.**

DURING **Point out any parts of the book that relate to the children's experiences making the treats.**

AFTER **Ask children to share something they learned from the book. Questions may include:**
Did anything we read help explain what happened when we made our snack?
What new words did you hear? Share with the group what you think those words mean. Refer to the book, as needed, to help with any new vocabulary. Be sure to share a child-friendly definition, if, needed or additional examples.

Ask children to discuss the learning event with each other.

Refer back to the STEM play and any data charts during the discussion.

Ask children to discuss what they learned about the topic.

HANDS-ON STEM CONTINUED

What did you learn from our time cooking? When you cook at home, have you seen similar things happen? Can you share an example?

HEALTHY SNACK

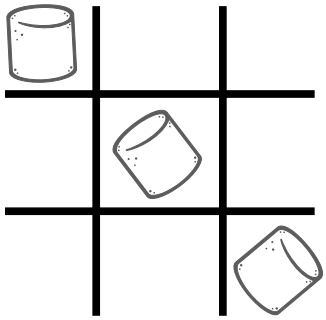
Crispy Rice Treats and Milk

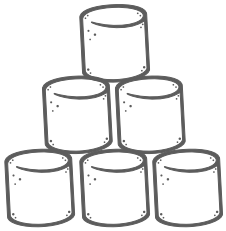
Enjoy your snack together!

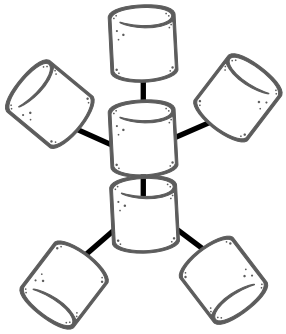
COMMUNITY-BUILDING

Marshmallow Games

1. **Tic-Tac-Marshmallow.** Use the Tic-tac-toe sheet provided, to play Tic-tac-toe with multicolored marshmallows.
2. **Marshmallow Towers.** Use marshmallows to see how tall of a tower children can build. This could be done individually or in small groups.
3. **Marshmallow Sculptures.** Use marshmallows and toothpicks to create sculptures.







CLOSING

Ask the children to share one thing that they learned today about marshmallows, force/motion, or matter. Share any reminders with the group.

Apply

Ask children to apply what they learned to new situations.

Redesign or rebuild, incorporating what they learned.

Ask children what they learned about themselves and the STEM-literacy concepts covered.

Optional

Plan and conduct additional matter investigations with the children. Here are a few ideas to get you started: Try placing the marshmallows somewhere cold, in different liquids, or in the microwave. What do you notice? Create a chart to record your findings and draw conclusions based on the information collected.

Home Connection

Remember to send home or email the 4-H Home Connections Letter to extend the learning and fun!

DEAR CLOVER KIDS PARENTS AND GUARDIANS,

Today at Clover Kids, we learned about the marvelous marshmallow! Did you know that the Rice Krispy Treat was created by an Iowan named Mildred Day? Clover Kids practiced STEM skills and learned about the science of marshmallows through fun and engaging activities such as:

- Making yummy crispy rice treats.
- Reading the book *A Camping Spree with Mr. Magee* by Chris Van Dusen.
- Launching marshmallows at a target.

- Matter can change when heat is applied.
- Distance from the target and the angle of the launcher make a difference.
- Working with others can help make ideas even better!

AT HOME

- When cooking at home, talk about the changes that can be observed when heat is applied. For example, when making a cake, discuss what the batter looks like before and after cooking.
- Adult-child idea: Make a launcher at home and then launch soft items at a target. Talk about how changing where the launcher is in the room changes where the object lands. Make other adjustments to the launcher and see what happens!
- Adult-child idea: Make some crispy rice treats together. A recipe can usually be found on the back of a bag of marshmallows. Yum!

DIG DEEPER

- To learn more about Iowan Mildred Day: https://www.housing.iastate.edu/halls/geoffroy/day/
- Check out other books about camping such as: *Curious George Goes Camping* by Margaret & H. A. Rey or *Cooking in a Can: More Campfire Recipes for Kids* by Kate White.
- Take part in more marshmallow investigations that can be found in the book *Candy Experiments* by Loralee Leavitt.

Thank you for being a part of Clover Kids today! We look forward to seeing you at our next meeting.

Sincerely,

Your Clover Kids Leader

MARVELOUS MARSHMALLOWS

MR. BEAR LETTER

Dear [Group],

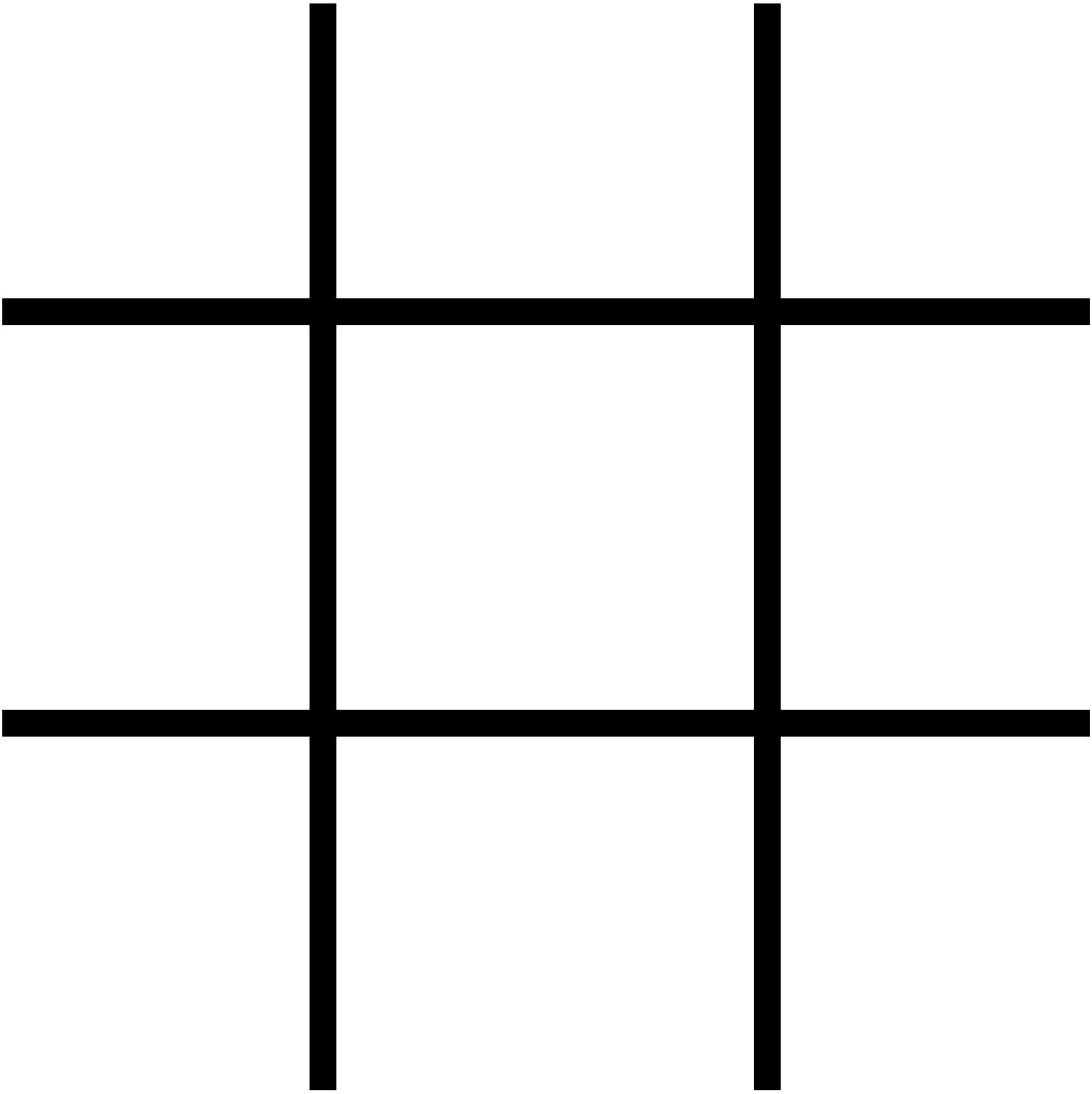
I hope that you are having a good day! My day is not going so well. I ran out of marvelous marshmallows and really miss their yummy taste. Would you be willing to launch some marshmallows over the trees to me please?
I will be waiting patiently in the forest for your response.

Your hungry friend,
Mr. Bear

P.S. It would be wonderful if you could please launch those yummy treats right into my mouth.

MARVELOUS MARSHMALLOWS

TIC-TAC-MARSHMALLOW



MUNCHING MYSTERIES

BIG idea

Children learn about the mystery and biography genres, how to solve mysteries, and use the Engineering Design Process to solve a problem.

AGENDA

Pledges and Announcements

STEM-Literacy Activity

Five Senses Guess What Activity (Iowa Foods)

Read Book The Case of the Stinky Stench by Josh Funk

Engineering Design Process: Bridge Made Out of Food

Mini-Mystery

Read Mildred Wirt Benson Biography Blurb

Healthy Snack: Mystery Snack

Community Building: Food Art, Watercolor Resist Technique

Closing: 4-H Home Connections Letter

KEY VOCABULARY

MYSTERY
a book, play, or movie that describes a crime and the process of solving it

STENCH
a very bad smell

BIOGRAPHY
the story of a real person's life, written by someone other than that person

Materials

- ❑ Mystery Bag with Iowa Food Item
- ❑ Chart Paper/Marker
- ❑ Book *The Case of the Stinky Stench* by Josh Funk
- ❑ Stinky Stench Challenge Map*
- ❑ Food for Building (Gumdrops & Toothpicks or Marshmallows & Spaghetti)
- ❑ Rulers
- ❑ Weight to Test Bridges (Ex: Food Cans, Box of Bolts)
- ❑ Engineering Design Process Poster*
- ❑ Two Clovers*
- ❑ Photo and Bio of Mildred Wirt Benson
- ❑ Copy of a Nancy Drew Book (Library)
- ❑ Watercolor Paper
- ❑ Crayons
- ❑ Watercolors

** Included with STEM-Lit TO GO!*

Healthy Snack Ingredients

- ❑ Pancakes
- ❑ French Toast

PLEDGES AND ANNOUNCEMENTS

We encourage you to begin your Clover Kids meeting by reciting the Pledge of Allegiance, followed by the 4-H Pledge, when appropriate.

4-H Pledge

I pledge my head to clearer thinking, my heart to greater loyalty, my hands to larger service, and my health to better living, for my club, my community, my country, and my world.

STEM-LITERACY ACTIVITY

Place an Iowa food item in the mystery bag. Using the five senses, collect information about what might be in the bag.

Ask children to help you figure out what is in the mystery bag! Share that the way to figure out what might be in the bag is to make observations using our five senses.

Sight: Using your sense of sight, what do you think is in the bag? Hold the bag up for the children to look at and have them share their ideas. Write down their ideas on chart paper.

Smell: Using your sense of smell, what do you think is in the bag? Allow one or more children to smell the bag and share their ideas. Write down their ideas on chart paper.

Hearing: Using your sense of hearing, what do you think is in the bag? Shake the bag for the children. Ask them to listen, and then have them share their ideas. Write down their ideas on chart paper.

Touch: Using your sense of touch, what do you think is in the bag? Allow one or more children to touch what is in the bag. Be sure not to let them see it! Write down their ideas on chart paper.

Taste: Using your sense of taste, what do you think is in the bag? Allow one or more children to taste what is in the bag. Be careful of any allergies. (This sense could be skipped if needed.) Write down their ideas on chart paper.

Go back through the list.

Key Vocabulary

MYSTERY
a book, play, or movie that describes a crime and the process of solving it

Ask children if there are any guesses that they may cross off now that we have made observations using all five of our senses. Share that it is ok to change your mind when you get new information. Together with the children, cross off ideas that the group doesn't think belong on the list anymore. Then reveal what is inside the bag!

Show the Iowa food that you have chosen to hide in the bag. Then ask children to share some of their favorite foods with you.

READ ALOUD

Transition to the read aloud. Hold up the book *The Case of the Stinky Stench*.

Key Vocabulary

STENCH
a very bad smell

What does stench mean? See if there are any clues in the sentence to help figure the word out (ex: stinky).

Share that this book is a mystery that involves food characters. Point out the characters on the cover. The characters are Lady Pancake and Sir French Toast. A mystery is a book that has a puzzle or problem to be solved.

READ ALOUD CONTINUED

BEFORE

Ask the children to listen closely to try and figure out what the puzzle is and how it is solved.

DURING

Focus on helping children understand the vocabulary. This book is heavy on vocabulary. Be sure to share child-friendly definitions for words such as:

Inspector: a person whose job is to inspect something
Nefarious: bad or not nice
Devious: willing to lie and trick people in order to get what is wanted
Lair: a place where someone hides
Delectable: very pleasant to taste or smell
Sleuthing: looking for information to solve crimes
Lurks: to wait in a hidden place, especially in order to do something wrong
Dejected: sad because of failure, loss, etc.
Decay: to be slowly broken down by the natural processes

AFTER

Ask the children the following questions:

What was the puzzle that needed to be solved?
How was it solved?
Do you ever have problems or mysteries that need to be solved? What did you do to solve them?

HANDS-ON STEM

Share: There is still one problem to be solved! Look at the map on the last page of the book. Lady Pancake (hold up the weight or fake Lady Pancake) needs to get across Casserole Cliff and Corn Chowder Lake to the other side or back to Sir French Toast and Inspector Croissant. Can you help her? You will need to design a way for Lady Pancake to make it back. However, you can only use the food that is available in the cupboard.

Do

Ask open-ended questions while children participate in STEM play.

Ask children about their ideas and listen carefully.

Encourage children to engage with the materials and try out new ideas.

CHALLENGE

Hand out the Stinky Stench Challenge Map Sheet. Share that this sheet shows you the length or the distance that Lady Pancake must travel. She must safely travel eight inches over the lake to get to her friends on the other side. In addition, share that the bridge must be at least one inch (or other distance) off the ground or above the water.

Show the food materials that are available for building. Then ask children to get together with a partner or group and begin talking and drawing a model of what they would like to build. After approval of the model from the group leader, have the children begin building their designs.

Next, test the bridges. To begin, make sure that each bridge is eight inches long and one inch off the ground.

Then place the fake Lady Pancake (weight) on the bridge to make sure that it will hold her.

HANDS-ON STEM CONTINUED

Record data on a chart for reference later. A sample chart is provided below.

Team Name	8 Inches Long?	1 Inch Off Ground?	Holds Lady Pancake?

Have the children present and test their designs. Discuss as a group what features worked well. Refer back to the data chart whenever possible.

Reflect

If you could make any changes to your design, what would they be and why? Hold a discussion on the possible changes. If time permits, do a redesign of the project so that children can improve their designs. Share that this process is the Engineering Design Process. Highlight this process by showing the Engineering Design Poster.

When the testing is complete, hold a brief discussion with the children.

Apply

Can you think of a time in your life when you have had to cross something like a lake? How did you get across it?

Can you think of other ways that we could get across a lake or a ravine/deep valley?

How did working in a team help you today?

Congratulate the children on their excellent work!

Ask children to discuss the learning event with each other.

Refer back to the STEM play and any data charts during the discussion.

Ask children to discuss what they learned about the topic.

READ ALOUD

Now I have another mystery for you! I have hidden something in the room, and I would like for you to find it, based on the clues that I will give you. The hidden object is a clover like this one (hold up example clover). Prepare five clues as to the location, for the children. Have the children silently roam around the room, looking for the clover. Gather the children back together after it is found. If time allows, repeat the process or have the children work in small groups to hide a clover and write a clue to help another group find it. Following the activity, have a discussion about Mildred Wirt Benson.

Ask children to apply what they learned to new situations.

Redesign or rebuild, incorporating what they learned.

Ask children what they learned about themselves and the STEM-literacy concepts covered.

BEFORE

What do you call someone who writes books? An author, correct! There is a famous mystery author from Iowa; her name is Mildred Wirt Benson (hold up the photo of Mildred Wirt Benson). Share that she has written the Nancy Drew books, a famous mystery series for children that features a character named Nancy Drew.
Here is a link to a photo and bio: https://data.desmoinesregister.com/famous-iowans/mildred-wirt-benson

Key Vocabulary

BIOGRAPHY
the story of a real person's life, written by someone other than that person

DURING

Read the biography to the children.

AFTER

I just read a story about a person to you. Do you remember what we call stories that are true and about a person? (A biography). If possible, check out some books from the local library from the Nancy Drew series and showcase one or two of them, for the children. Read a portion of the book (2–3 pages).

Optional

Prepare a fun, short biography about yourself to share with the group.

HEALTHY SNACK

Mystery Snack

Pick one of the characters from the book The Case of the Stinky Stench and create him/her, for some snacking fun. For example, create a Lady Pancake or Sir French Toast. Or create your own food characters and name them. Take a photo to share with friends and family!

COMMUNITY-BUILDING

Food Art, Watercolor Resist Technique

Draw a favorite food or favorite book character with crayons on watercolor paper. It can be fun to use a white or black crayon for this part; however, any color crayon can be used. Be sure to leave some blank spaces to paint in later. Then paint over the crayon picture with watercolors. Have fun filling in the blank spaces with different watercolors! This process may need to be modeled for children new to watercolor resist technique. Allow time for pictures to dry before sending home.

CLOSING

Review all that was done that day, asking children to share one thing that they learned. Share reminders with group.

Home Connection

Remember to send home or email the 4-H Home Connections Letter to extend the learning and fun!

4-H CLOVER KIDS

DEAR CLOVER KIDS PARENTS AND GUARDIANS,

Today at Clover Kids, we learned about mysteries and how to solve them! Did you know that Mildred Wirt Benson, one author of the famous Nancy Drew mystery series, grew up in Iowa? Clover Kids learned more about mysteries through fun and engaging activities such as:

- Reading *The Case of the Stinky Stench* by Josh Funk.
- Participating in an engineering challenge to help Lady Pancake get across Corn Chowder Lake.
- Solving a mini-mystery as a group and finding the missing clover.

- Solving mysteries encourages us to think and use all our five senses.
- Learning new vocabulary is important. We learned lots of new words from our readings today.
- Working together is an important part of solving mysteries and meeting challenges!

AT HOME

- Read more books from the Nancy Drew mystery series. Check your local library to see if there may be books you can check out!
- Conduct your own mystery at home. Hide an object, and then write out clues to help your family find it!
- Place an item in a mystery bag. Then take turns giving clues and guess what may be inside the bag.

DIG DEEPER

- Explore mysteries by reading one of these great books! http://www.readingrockets.org/booklists/young-detectives
- Explore more mystery books targeted to the older Clover Kids. https://www.scholastic.com/teachers/articles/teaching-content/books-support-mystery-genre-study/

Thank you for being a part of Clover Kids today! We look forward to seeing you at our next meeting.

Sincerely,

Your Clover Kids Leader

IOWA STATE UNIVERSITY
Extension and Outreach

MUNCHING MYSTERIES

STINKY STENCH CHALLENGE MAP SHEET

Help Lady Pancacke get across Corn Chowder Lake!

SCREAM FOR ICE CREAM

Children explore chemistry and the states of matter through investigations that end in a delicious sweet treat—ICE CREAM!

AGENDA

Pledges and Announcements

STEM-Literacy Activity

Read Book *Should I Share My Ice Cream? An Elephant & Piggie Book* by Mo Willems

What is Matter?

Matter I Spy

Make Ice Cream

Healthy Snack: Ice Cream

STEM-Literacy Activity *Continued*

Read Book *From Milk to Ice Cream* by Stacy Taus-Bolstad

Ice Cream Careers

Flavor Creator

Community Building: Ice Cream Relay

Closing: 4-H Home Connections Letter

KEY VOCABULARY

SYNONYM
a word that has the same meaning as another word in the same language

SOLID
firm or hard: not having the form of a gas or liquid

LIQUID
a substance that is able to flow freely

GAS
a substance, such as oxygen or hydrogen, that is like air and has no fixed shape

Materials

- ❑ Book *Should I Share My Ice Cream* by Mo Willems
- ❑ Items for Matter I Spy
- ❑ Chart Paper/Markers
- ❑ Crushed Ice
- ❑ Coarse Salt
- ❑ Pint-Size Plastic Freezer Bags
- ❑ Gallon-Size Plastic Freezer Bags
- ❑ Gloves or Towels
- ❑ Spoons
- ❑ Sticky Notes
- ❑ Book From Milk to Ice Cream by Stacy Taus-Bolstad
- ❑ Ball Pit Balls
- ❑ Card Stock
- ❑ Tape

** Included with STEM-Lit TO GO!*

Healthy Snack Ingredients

- ❑ Whipping Cream
- ❑ Half-and-Half Cream
- ❑ Sugar
- ❑ Vanilla
- ❑ Toppings

PLEDGES AND ANNOUNCEMENTS

We encourage you to begin your Clover Kids meeting by reciting the Pledge of Allegiance, followed by the 4-H Pledge, when appropriate.

4-H Pledge

I pledge my head to clearer thinking, my heart to greater loyalty, my hands to larger service, and my health to better living, for my club, my community, my country, and my world.

STEM-LITERACY ACTIVITY

What is your favorite cold treat to eat on a hot summer day?

Why?

There are many different companies that make ice cream, like Ben & Jerry's, Breyers, and Haagen-Dazs. Did you know there is a very popular brand of ice cream made right here in Iowa? Blue Bunny is a brand of ice cream made by the Wells Company in Le Mars, Iowa. Le Mars is located in Plymouth County in Northwest Iowa. More than 80 years ago, Blue Bunny set out to create delicious ice cream, and today Le Mars is known as "The Ice Cream Capital of the World."

If time permits, show the following video about Le Mars "Ice Cream Days" https://www.youtube.com/watch?v=km9B6qp62dE

READ ALOUD

Read the book *Should I Share My Ice Cream? An Elephant & Piggie Book* by Mo Willems.

BEFORE

Hold up the book and ask:
What does the title tell you about this book?
Give me a thumbs up if you like ice cream.
What do you think may happen in this story?

DURING

Page 13: Can you think of any other words you would use to describe ice cream? Great! Some of those words are synonyms, which means they have the same meaning! What were some of the synonyms you heard? List synonyms on chart paper.
Page 22/23: What is happening to Elephant's ice cream? Why?
Page 29: What does the cloud around Piggie mean?
Page 38: What do you think is going to happen next?

Key Vocabulary

SYNONYM
a word that has the same meaning as another word in the same language

AFTER

Hold a discussion about the book with the children.
Why did it take Elephant so long to decide what to do with his ice cream?
What happened to Elephant's ice cream? Why do you think that happened?
Can you think of anything else that melts like Elephant's ice cream?

HANDS-ON STEM

What is Matter?

Today as we learn about ice cream, we will also be talking about the states of matter. Raise your hand if you have heard of matter before. Who can tell me something about matter? Ask a few children to share their ideas about matter.

Matter is the word for the stuff things are made of. Everything around us is made of matter! There are three common states of matter: solid, liquid, and gas.

Solid: Solids can be hard or soft, but all solids keep their shape unless you do something to change them.

Liquid: Liquids do not have a shape of their own; they take the shape of the container they are in.

Gas: Gases are air-like substances that have no shape and move around freely or fill the container they are in, like air in a balloon.

Key Vocabulary

SOLID
firm or hard: not having the form of a gas or liquid

LIQUID
a substance that is able to flow freely

GAS
a substance, such as oxygen or hydrogen, that is like air and has no fixed shape

Matter I Spy

Prior to this activity, place items around the room to ensure children have the opportunity to identify all three states of matter.

On chart paper, create the following:

Matter

Matter takes up space, has mass, and is everywhere!

Solid	Liquid	Gas

Play I Spy with the children to locate and identify items from the three states of matter. Be sure to record the children's responses on the data chart.

Facilitator Examples:

I spy…

a solid that is small, round, and red. Apple

a liquid that is cold, yellow, and sweet. Lemonade

a round object filled with a gas. Beach Ball

A state of matter can change when heat is added or taken away. Can you think of any examples of when matter might change from a solid to a liquid when it is heated? Ice cubes turn into water. What about an example of matter changing from a liquid to a gas? Water boils into steam. Or a liquid to a solid? Water freezes into ice.

Make Ice Cream

Think back to our book. What state of matter was Elephant's ice cream?

It started as a solid.

What shape was the ice cream when it was a solid?

A round scoop.

Then what state of matter did it turn into?

A liquid!

Do you know why that happened?

It got too hot and melted.

Now that we learned what ice cream is made up of (matter), it's time for us to make our own delicious ice cream!

Ice Cream in a Bag

The following recipe makes about eight half-cup servings.

Ingredients

2 cups heavy whipping cream

2 cups half-and-half cream

1/2 cup white sugar

2 teaspoons vanilla extract

1 bag crushed ice

4 cups coarse salt

Materials Needed for Each Child:

2 pint-size plastic freezer bags

1 gallon-size plastic freezer bag

Gloves or towel to protect fingers

- Ask open-ended questions while children participate in STEM play.
- Ask children about their ideas and listen carefully.
- Encourage children to engage with the materials and try out new ideas.

Directions:

Before you begin, divide the children into groups of six. Each child will get their own baggie of ice cream. Make sure the children wash their hands. You may also want to discuss a few health and safety rules that are important to remember while preparing food.

1. In a pitcher or large measuring cup, stir together the whipping cream, half-and-half, sugar, and vanilla extract until the sugar has dissolved.
2. Pour about 1/2 cup of mixture into a pint-size plastic bag and seal carefully, squeezing out extra air. Place each sealed bag into a second pint-size bag, again squeezing out extra air. Seal carefully.
3. Fill each gallon-size plastic bag about halfway with ice and add 1/2 cup coarse salt. Place one sealed small bag into the large bag, squeeze out most of the air, and seal the large bag.
4. Have the children wear gloves or wrap the bag in a towel, to protect their hands against the extreme cold. Shake and massage the bag for 5-10 minutes or until mixture thickens into ice cream. Add more salt and ice to the outer bag if ice cream hasn't formed after 10 minutes of continuous motion.
5. Remove the outer pint-size bag before you open the inner bag so you don't get any of the salty ice on your ice cream!

Helpful Hint

Watch a step-by-step video for guidance: http://dish.allrecipes.com/how-to-make-ice-cream-in-a-bag/

While the children are mixing their ice cream, ask questions about what is happening to the ice cream mixture and what is happening to the ice in their bag. This is also a great time to take a poll of their favorite ice cream flavors. Graph the results with sticky notes on large chart paper.

HEALTHY SNACK

Ice Cream in a Bag

Children can eat their delicious ice cream! Provide a variety of toppings, be mindful of allergies, and don't forget healthy options.

HANDS-ON STEM

While the children enjoy their ice cream, discuss the following:

Reflect

What did you do to turn the liquid ice cream mixture into solid ice cream?

Cool the mixture.

What differences did you notice between the liquid ice cream mixture and solid ice cream?

Apply

Can you provide other examples of states of matter changing when they are heated or cooled?

READ ALOUD

Now that we learned how to make homemade ice cream, we are going to read a book that shows us how companies like Blue Bunny make big batches of ice cream to sell at the grocery store.

Read the non-fiction book *From Milk to Ice Cream* by Stacy Taus-Bolstad

Hold a discussion with the children.

We are going to read *From Milk to Ice Cream* by Stacy Taus-Bolstad. Does anyone have a prediction about how this book may start?

Who knows where the milk comes from to make the ice cream?

DURING **Use the Glossary on page 24 to define the bold words: flavors, freezer, germs, and vat.**

AFTER **Discuss the book as a group.**

Who remembers what happened first?
What state of matter is milk?
What made the ice cream mix safe to eat? (the mix must get hot to kill the germs)
How did the ice cream mix go from a liquid to a solid? (freezing it, taking away heat)
What did we use to make our ice cream solid? (ice with salt)
What may make the ice cream become a liquid again? (heating it)

Ask children to discuss the learning event with each other.

Refer back to the STEM play and any data charts during the discussion.

Ask children to discuss what they learned about the topic.

Ask children to apply what they learned to new situations.

Redesign or rebuild, incorporating what they learned.

Ask children what they learned about themselves and the STEM-literacy concepts covered.

STEM-LITERACY ACTIVITY

Ice Cream Careers:

There are many cool jobs involved in the ice cream business.

What were some of the jobs we learned about in the book *From Milk to Cow?*

(Farmers, truck drivers, and factory workers.)

Can you think of any other jobs that were not mentioned in the book?

(Examples include: grocery workers, ice cream parlor employees, flavor creators, and taste testers.)

Senior Food Scientist: https://www.youtube.com/watch?v=I8Gpa67i-f4

Check out this video about a Senior Food Scientist at Wells Blue Bunny who helps create new flavors:

Taste Testers—Blue Bunny looks for people over the age of 18 to sign up to be taste testers. Taste testers provide information about themselves, taste new ice cream flavors, share their thoughts about the flavors, and even get paid for this awesome job!

Optional

Invent a Flavor

Have children work in pairs or small groups to create a new flavor of ice cream.

1. Build Your Flavor Combination: Ice cream, chunks, and swirls—the possibilities are endless!
2. Name Your Flavor: You can use rhyming words, awesome alliterations, and delicious descriptions. Be Creative!
3. Draw a picture of your one-of-a-kind creation!

COMMUNITY-BUILDING

Ice Cream Relay

Have children line up in teams but note that this is not a race. Give the children a real ice cream cone or create one by rolling cardstock into a cone shape and taping. On the opposite side of the room, place a bucket of balls ("ice cream") on the floor. Place a second empty bucket at the start of each team's line. Then have the children run to the bucket of balls, pick up a ball, and place it on their cones. Children then walk quickly back to their team and drop their "ice cream" into the other bucket. The activity continues until each child has a turn.

CLOSING

Ask children what they learned about matter today. Share any reminders with the group.

Home Connection

Remember to send home or email the 4-H Home Connections Letter to extend the learning and fun!

4-H CLOVER KIDS

DEAR CLOVER KIDS PARENTS AND GUARDIANS,

Today at Clover Kids, we learned about states of matter through making a yummy treat—homemade ice cream! Did you know that The Ice Cream Capitol of the World is in Le Mars, Iowa?

Clover Kids learned about the states of matter and how ice cream is made through fun and engaging activities such as:

- Reading *Should I Share My Ice Cream? An Elephant & Piggie Book* by Mo Willems.
- Participating in a game of I Spy to identify objects made up of the three states of matter.
- Making delicious ice cream and graphing our favorite toppings!

- There are three common states of matter: solid, liquid, and gas.
- Adding heat or taking it away can change matter from one state to another.
- Many STEM careers are involved in making ice cream.

AT HOME

- Watch this short video about matter
  - http://studyjams.scholastic.com/studyjams/jams/science/matter/solids-liquids-gases.htm
- Make ice cream in a bag with your family
- Read *What is the World Made Of* by Kathleen Wiedner Zoehfeld

DIG DEEPER

- Read *Bartholomew and the Oobleck* by Dr. Seuss and make Oobleck, a non-Newtonian fluid that exhibits the properties of both a solid and liquid.
- Try these activities with Oobleck, from Michigan State University Extension
  - http://msue.anr.msu.edu/news/science_ideas_for_young_children_part_9_oobleck

Thank you for being a part of Clover Kids today! We look forward to seeing you at our next meeting.

Sincerely,

Your Clover Kids Leader

IOWA STATE UNIVERSITY
Extension and Outreach

SOUND ALL AROUND

BIG idea

Children learn about the elements of music such as rhythm and pitch, how sound is produced, and design their own instruments.

AGENDA

Pledges and Announcements

STEM-Literacy Activity

Read Book *I Got The Rhythm* by Connie Schofield-Morrison

Sound Effect Game

Read Book *Why Can't I Hear That? Pitch and Frequency* by Richard and Louise A. Spilsbury

Sound Investigations and Group Discussion

Instrument Design Challenge

Healthy Snack: Crispy Crackers and Carbonated Juice

Community Building: Make a Music Video

Closing: 4-H Home Connections Letter

KEY VOCABULARY

SOUND
something that is heard

RHYTHM
a regular, repeated pattern of sounds or movements

VIBRATIONS
a continuous slight shaking movement

PITCH
the highness or lowness of a sound

Materials

- ❑ Rhythm Sticks or Other Rhythm Instruments
- ❑ Book *I Got The Rhythm* by Connie Schofield-Morrison
- ❑ Book *Why Can't I Hear That? Pitch and Frequency* by Richard and Louise A. Spilsbury
- ❑ Plastic Ruler
- ❑ 8-Note Handbells
- ❑ Handbell Music (Optional)
- ❑ Rubber Bands of Various Sizes, Widths
- ❑ Shallow Rectangular Baking Sheet (Bottom of Rubber Band Instrument)
- ❑ Chart Paper/Marker
- ❑ Instrument Design Challenge Materials Such As Small Boxes, Small Jars, Rubber Bands, Pipe Cleaners, Tape, String, Rulers, Scissors
- ❑ Recording of "76 Trombones" by Meredith Wilson or Other Song (For Music Video/ Recording)

** Included with STEM-Lit TO GO!*

Healthy Snack Ingredients

- ❑ Crackers
- ❑ Carbonated Juice
- ❑ Optional: Carrots, Snap Peas, or Celery

PLEDGES AND ANNOUNCEMENTS

We encourage you to begin your Clover Kids meeting by reciting the Pledge of Allegiance, followed by the 4-H Pledge, when appropriate.

4-H Pledge

I pledge my head to clearer thinking, my heart to greater loyalty, my hands to larger service, and my health to better living, for my club, my community, my country, and my world.

STEM-LITERACY ACTIVITY

Introduce the rhythm sticks to the children and model how to safely use the sticks.

Hand out a pair of sticks to each child.

Then tap a pattern on the floor for the children.

Ask them to repeat the pattern or rhythm back to you.

Repeat this process with various rhythms. Select a few children to create rhythmic patterns for the group to copy. It might also be fun to tap in time to music or to change the tempo/speed of the tapping. Gather the sticks when done with the activity.

READ ALOUD

Read the book *I Got The Rhythm* by Connie Schofield-Morrison.

BEFORE

Share with the children that today you will be reading a book about a girl who finds rhythm all around—in her house, on the street, and in many other places!

Ask the children: What is rhythm? Did we have rhythm when we were tapping our sticks (yes!). Share that rhythm is a regular, repeated pattern of beats, sounds, activity, or movements (like what we did earlier with our rhythm sticks).

The title of the book is I Got The Rhythm, by Connie Schofield-Morrison. Now when I read this book, there are some rhythms that you will be repeating. Be ready and listen closely for directions.

Key Vocabulary

RHYTHM
a regular, repeated pattern of sounds or movements

DURING

Read the book to a steady beat. Encourage children to repeat the rhythm words and do the matching actions. For example, on pages that say:

"Think, think": Point to head twice to a beat
"Beat, beat": Tap the floor twice to a beat
"Blink, blink": Blink eyes twice to a beat
"Sniff, sniff": Sniff twice in the air to a beat
*Continue having the children repeat the rhythm words and do the matching actions. Whenever possible, ask the children to help create the actions.

AFTER

Hold a discussion about the book. When do you feel that you have the rhythm? Can you share an example with us? What was your favorite rhythm action from the book?

Write out a few action words (ex: sniff, sniff) on chart paper. Point to the words in various order and ask children to do the matching action. Have fun with this pointing game by speeding up or slowing down how fast you do this as a group!

READ ALOUD CONTINUED

Sound is all around us, and there can be a rhythm to that sound! What sounds or rhythms do you hear at home or school? Discuss this question with the children.

Introduce the sound guessing game.

- Share: I have a game for us to play that focuses on sounds all around us! I am going to play a sound that you may hear in your neighborhood/city/state. After I play it, I want you to say what you think made that sound.
- Play sound effects recordings. For example, a sound effects recording may include sounds from the children's world such as (1) a neighborhood bus, (2) a bell from your town, (3) the voice of someone the children know, or (4) a famous Iowa singer.
- Next, try playing two different sounds or two different rhythms and asking the children if they are the same or different. Feel free to get as tricky as you want, depending on the age of the group.

Take time to discuss the sounds of the game.

What is sound?

Listen to and discuss the children's ideas. Then share that the group will be conducting a few investigations to learn more about sound.

Helpful Hint

For the sound guessing game, sounds can be made with real objects, instead of using a sound effects recording. Have children close their eyes while you make different sounds.

Key Vocabulary

SOUND
something that is heard

READ ALOUD

Introduce the book *Why Can't I Hear That? Pitch and Frequency* by Richard and Louise A. Spilsbury.

Do the Testing Vibrations activity found on page 7 of the book.

Place the ruler on the edge of the table so that a short end of it hangs over the edge. Have the children listen closely while you hold the ruler tightly and pluck the end of the ruler to make it vibrate.

What do you notice?

Repeat the same steps but change the amount of ruler hanging over the edge of the table.

What do you notice now?

The children should notice that a short length of the ruler vibrates quickly and makes a higher-pitched sound, while a long length of ruler vibrates slowly and makes a lower-pitched sound.

Read pages 4-6 of the book *Why Can't I Hear That? Pitch and Frequency* to help further clarify the concepts.

Key Vocabulary

PITCH
the highness or lowness of a sound

HANDS-ON STEM

Share that the children will now be further exploring sound at three stations.

The stations can be done one at a time or as a rotation.

- **Station 1:** Handbells. Have children play with the handbells. What do you notice? After time for play, have the children ring the bells, and then quickly grab the bells with their hands. What is happening? Why did the sound stop? Discuss and tie the children's ideas to the concept of vibrations. Next, discuss pitch and ask the children to share which bells have a high pitch and which bells have a low pitch. If time permits, have the children play a song with you. There are free downloads for handbell music online.
- **Station 2:** Rubber band instruments. Have children make a rubber band instrument (see page 16 of Why Can't I Hear That? book for directions) and allow time for play. Ask them to notice how the sound changes when you lengthen/shorten the rubber bands and if the thickness of the rubber bands plays a role. Discuss and tie to the concept of pitch and/or vibrations. If time permits, have the children strum to a rhythm that you tap out.
- **Station 3:** Real string instruments, such as guitars. Have the children try out the instruments and pluck the strings. Discuss and tie to the concept of pitch and/or vibrations (see page 14 of Why Can't I Hear That? book for explanation of science). If no string instruments are available, consider playing a short video showcasing a guitar or harp.

Gather the children back together in a group. Discuss the results of the investigations. Have the children discuss what they learned about sound, vibrations, and pitch. Create a list of core concepts that the children learned from conducting the investigations on chart paper. Then ask the children to share any new questions they may have now. If time permits, explore ways to answer those questions.

The book *Why Can't I Hear That? Pitch and Frequency* can be used to further clarify concepts or answer questions the children may have about sound. Feel free to do the extra activities described in the book.

CHALLENGE

Share that you now have a design challenge for the group. Let the children know that a local band would like for them to create a drum (or other instrument) that produces a low sound (or high) and helps the band keep a steady beat. Split the children into pairs and share that each group will work to design and create an instrument. If a group gets done early, consider having them write a short song to perform.

Pass out the instrument materials bag and/or have a table with instrument materials ready for the group. Have the children examine the materials before drawing a 2-D instrument model for your review. Then have each group create their instrument from the materials provided. Play music while the children work.

Have an instrument showcase. Encourage each group to play and explain how their instrument produces sound. In particular, ask each group why their instrument has a nice, low pitch. If the instrument is not low sounding, ask what changes could be made.

Do

Key Vocabulary

VIBRATIONS
a continuous slight shaking movement

- Ask open-ended questions while children participate in STEM play.
- Ask children about their ideas and listen carefully.
- Encourage children to engage with the materials and try out new ideas.

Reflect

- Ask children to discuss the learning event with each other.
- Refer back to the STEM play and any data charts during the discussion.
- Ask children to discuss what they learned about the topic.

CHALLENGE CONTINUED

What did you learn about sound? What did you learn about rhythm? What is pitch? Where do you see examples of each of these in your life? (ex: bell choirs, desk bells, piano, singing, other instruments)

Apply

Ask children to apply what they learned to new situations.

Redesign or rebuild, incorporating what they learned.

Ask children what they learned about themselves and the STEM-literacy concepts covered.

HEALTHY SNACK

Crispy Crackers and Carbonated Juice

Place some of the chosen crackers in a bag that the children aren't able to see through and gently shake the bag. Then ask the children to guess what the snack is, based on the sound that they hear. Consider crunching your crackers in time to the music. Foods such as carrots, snap peas, or celery could also be used for this snack.

COMMUNITY-BUILDING

Music Video

Create a music video with your group! Have the children play their instruments while singing to "76 Trombones" from a famous Iowa musical—The Music Man (or another favorite song)! Record the experience so it can be shared with parents/guardians.

Optional

Consider writing your own song to record. Using a karaoke track from a familiar, age-appropriate song, have the children write their own lyrics as a group. You could even write a song about sound or what the children learned that day.
Be sure to share the video with parents/guardians!

CLOSING

Ask the children to share one thing that they learned today about sound.
Share any reminders with the group, to extend the learning and fun.

Home Connection

Remember to send home or email the 4-H Home Connections Letter to extend the learning and fun!

4-H CLOVER KIDS

DEAR CLOVER KIDS PARENTS AND GUARDIANS,

Today at Clover Kids, we learned more about sound and even designed our own instruments! We encourage you to ask your child about what they learned at our meeting today. Clover Kids learned more about sound, through fun and engaging activities such as:

- Reading *I Got The Rhythm* by Connie Schofield-Morrison
- Creating a musical instrument
- Playing with rhythm sticks and handbells

- Sound is a vibration or wave that travels through matter (solid, liquid, or gas) and can be heard.
- Pitch is whether a sound is "high" or "low."
- Vibrations are an important part of sound. Faster vibrations produce higher sounds.

AT HOME

- See if your library has rhythm instruments to check out. Tap them to the beat of your favorite songs at home!
- Make a sound guessing game and play it at home: https://www.scholastic.com/teachers/lesson-plans/teaching-content/activity-plan-3-4-sound-guessing-game/
- Dance to the beat of your favorite songs! Have everyone show off their best dance moves.

DIG DEEPER

- Explore more about sound: https://www.pbslearningmedia.org/resource/phy03.sci.phys.howmove.lp_sound/sound-vibrations/#.WwcThEgvw2y
- Check out the book *Sound* by Abbie Dunne (Pebble Plus Book)
- Look for the book *All About Sound: Rookie Read About Science* by Lisa Trumbauer

Thank you for being a part of Clover Kids today! We look forward to seeing you at our next meeting.

Sincerely,

Your Clover Kids Leader

IOWA STATE UNIVERSITY
Extension and Outreach

SUPER SHAPES

STEM-Lit TO GO! iowa

Children will learn about shapes and explore shapes in their world.

AGENDA

Pledges and Announcements

STEM-Literacy Activity

- Review of Shapes with Playdough
- Read Book *City Shapes* by Diana Murray
- Shape Hunt, Photography, or Shape Hunt Sheet
- Iowa Tangrams
- Read Book *The Greedy Triangle* by Marilyn Burns

Healthy Snack: Shape Foods

Community Building: Four Corners Shape Game

Closing: 4-H Home Connections Letter

KEY VOCABULARY

LINE
a long narrow mark on a surface

ANGLE
the space or shape formed when two lines or surfaces meet each other

DISSATISFIED
not happy or pleased

Materials

- ❑ Playdough
- ❑ Playdough Accessories
- ❑ Shape Cards*
- ❑ Book City Shapes by Diana Murray
- ❑ Shape Hunt Sheet*
- ❑ Camera (Optional)
- ❑ Clipboards (Optional)
- ❑ Tangrams
- ❑ Iowa Tangram Sheets*
- ❑ Three Popsicle Sticks
- ❑ Book *The Greedy Triangle* by Marilyn Burns
- ❑ Pencils
- ❑ Chart Paper/Marker

** Included with STEM-Lit TO GO!*

Healthy Snack Ingredients

- ❑ Foods in a variety of shapes
- ❑ Cookie Cutters (Optional)
- ❑ Look at the natural shapes of food (Ex: cutting an apple in half horizontally will reveal a star on the inside.)

PLEDGES AND ANNOUNCEMENTS

We encourage you to begin your Clover Kids meeting by reciting the Pledge of Allegiance, followed by the 4-H Pledge, when appropriate.

4-H Pledge

I pledge my head to clearer thinking, my heart to greater loyalty, my hands to larger service, and my health to better living, for my club, my community, my country, and my world.

STEM-LITERACY ACTIVITY

Begin by laying out the playdough and accessories (playdough scissors, rolling pins, etc.) for the children.

Have the children play for a short amount of time with the materials. Then show the children how to roll a piece of dough into a long "snake."

Once the children have made their dough snakes, ask the children to bend the snakes into a circle while holding up the circle shape card.

Look around and check all of the circles. Give shape suggestions as needed.

Then ask children to squish the dough up into a ball.

Repeat the process of roll, hold up card, make shape, check, and squish for the following shapes: square, rectangle, triangle, oval, diamond, star, and others as you see fit.

READ ALOUD

After cleaning up, ask the children to join you in the read aloud area. Present the book *City Shapes* by Diana Murray to the children. Share with them that this book is all about the shapes that we just practiced making.

Read the title City Shapes.

What do you think this book is going to be about based on its title?

Have the children think-pair-share. First think, pair up with another child to discuss ideas, and then share with the whole group.

Right! This book is going to be about shapes in the city. Now as I read, I want you to pay close attention to all of the shapes in the illustrations or pictures of this book.

DURING

While reading the book, be sure to point out all of the shapes in the illustrations.

It might also be fun to have some of the children come up to point out shapes in the illustrations.

AFTER

Begin a discussion about the book with the children. Sample questions follow.

Were we right? Was this book about shapes in the city? (yes!)
What else did you notice about this book? (answers may include: it rhymes; it was about a pigeon, etc.)
Do you see shapes in our room? Where? Use the shape cards to help. Hold up one card, review it with the children, and then ask them to find that shape in the room.

HANDS-ON STEM

Just like the book, we are going to be looking for shapes in our world by going on a shape hunt! Introduce the Shape Hunt Sheet and answer any questions children might have about it. Hand out a sheet, clipboard, and pencil to each child. Then have fun going on your hunt.

Go on a shape hunt and collect data using the Shape Hunt Sheet.

Pull the group back together and share the results of the shape hunt. On chart paper, keep tallies of how many of each shape was found on the hunt.

Which shape did we find the most? Which shape did we find the least? Why do you think that is?

We found shapes all around us. Now we are going to use what we know about shapes to have some fun with tangrams. Introduce tangrams to the children. Share that the pieces can be used to create shapes such as animals, buildings, and even food!

Allow time for play with the tangrams. Then introduce the Iowa Shapes Templates to the group.

1. Iowa State Tree: Oak (the template shows an outline of a tree)
2. Iowa State Bird: Goldfinch (the template shows an outline of the bird)
3. Iowa State Flower: Wild Rose (the template shows an outline of the flower)
4. Iowa State Capitol: Des Moines (the template shows an outline of a building)

Encourage the children to work together to figure out how to use the tangrams to fill in the Iowa Shapes Templates. If needed, give hints to help children that may be struggling or provide them with an answer key and ask them to simply place the tangram pieces on the sheet.

When done, ask the children to come up with their own tangram shape creations! Then have them present the shapes to the group.

There are so many super shapes all around us! Let's now read this story about a triangle to learn even more.

READ ALOUD

Read *The Greedy Triangle* by Marilyn Burns.

BEFORE

Using three popsicle sticks, arrange them into a triangle for the group. The sticks could be taped to the chart paper or arranged on the floor.

Review the name of the shape with the children, and then ask:
How do we know this is a triangle? (three sides, three angles)
What is an angle? If needed, share the definition with the group. (an angle is formed when two lines meet at a shared point.)
Point out where each angle is on the triangle.
Great. Now I want you to pay attention as I read and listen for these words: "angle" and "line."

DURING

Focus on vocabulary and predicting the next shape.
Define the word "dissatisfied" for the group.
As new shapes are introduced, review the shape names and characteristics with the children.

Do

Ask open-ended questions while children participate in STEM play.

Ask children about their ideas and listen carefully.

Encourage children to engage with the materials and try out new ideas.

Optional

Split children into shape teams and assign a shape from the Shape Hunt Sheet to each team. For example, one group will hunt for circles while another group hunts for triangles. Each group hunts for their shape and picks an interesting example. The leader can then take a photo of the shape using his/her phone. These photos could then be emailed to parents/guardians to show what the group has been doing or made into a group book about shapes!

Key Vocabulary

DISSATISFIED
not happy or pleased

READ ALOUD CONTINUED

AFTER **Begin a discussion about the book.**

Ask children to share their thoughts on the book. Do you think the title fits the book? Why or why not?

Ask questions such as: Where can we see these shapes in our lives? What do you think the Greedy Triangle is going to turn into next? Why were the words "angle" and "line" important?

HANDS-ON STEM

Continue the discussion with the children.

Where do we see shapes in our lives? What are some examples of circles (change to other shapes next) in our lives? To conclude, hold up the shape cards, asking the children to create each shape with their bodies. Have fun with this!

Reflect

Apply

HEALTHY SNACK

Eat foods in a variety of shapes. Cookie cutters may be one way to create some fun shape foods for the children or look at the natural shapes of food (ex: cutting an apple in half horizontally will reveal a star on the inside).

COMMUNITY-BUILDING

Play the game Four Corners with the shape cards. Place one shape card in each corner.
Pick one person to be "it" and ask him/her to close his/her eyes. Then ask the rest of the group to pick a corner. Keeping eyes closed, the "it" person will call out a shape or a corner. The group that is by that shape then sits down in the middle and is out for this round. Repeat this process until only one person remains in a corner. That person can be the new "it."

CLOSING

Ask the children to share one thing that they learned today about shapes. Share any reminders with the group.

Key Vocabulary

LINE
a long narrow mark on a surface

ANGLE
the space or shape formed when two lines or surfaces meet each other

Ask children to discuss the learning event with each other.

Refer back to the STEM play and any data charts during the discussion.

Ask children to discuss what they learned about the topic.

Ask children to apply what they learned to new situations.

Redesign or rebuild, incorporating what they learned.

Ask children what they learned about themselves and the STEM-literacy concepts covered.

Home Connection

Remember to send home or email the 4-H Home Connections Letter to extend the learning and fun!

4-H CLOVER KIDS

DEAR CLOVER KIDS PARENTS AND GUARDIANS,

Today at Clover Kids, we learned about shapes and worked with tangrams. Did you know that tangrams are made of a square divided into seven pieces—one parallelogram, one square, and five triangles? These pieces can then be arranged into a variety of fun shapes! Clover Kids learned about shapes through fun and engaging activities such as:

- Reading City Shapes by Diana Murray.
- Conducting a shape hunt.
- Using tangrams to build a famous building, the state flower, and more!

- Shapes are all around us.
- Shapes play an important part in many jobs such as engineers and artists.
- Iowa has designated the following:
  - Iowa State Tree: Oak
  - Iowa State Bird: Goldfinch
  - Iowa State Flower: Wild Rose
  - Iowa State Capitol: Des Moines

AT HOME

- Take a trip to see/locate the state tree, bird, flower, or capitol.
- Go on a shape hunt at home. See how many shapes you can find!
- Check out the book Shapes, Shapes, Shapes by Tana Holborn from your local library. This is a wordless picture book with directions on how to use it at the beginning.

DIG DEEPER

- With an adult, visit the tangram site to learn more about tangrams and download free puzzles: https://www.tangram-channel.com/
- With an adult, check out some of the fun tangram videos online. There are some pretty cool ideas out there!
- Check out a tangram puzzle book from the library, for extra practice.

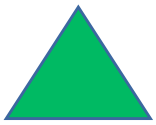
Thank you for being a part of Clover Kids today! We look forward to seeing you at our next meeting.

Sincerely,

Your Clover Kids Leader

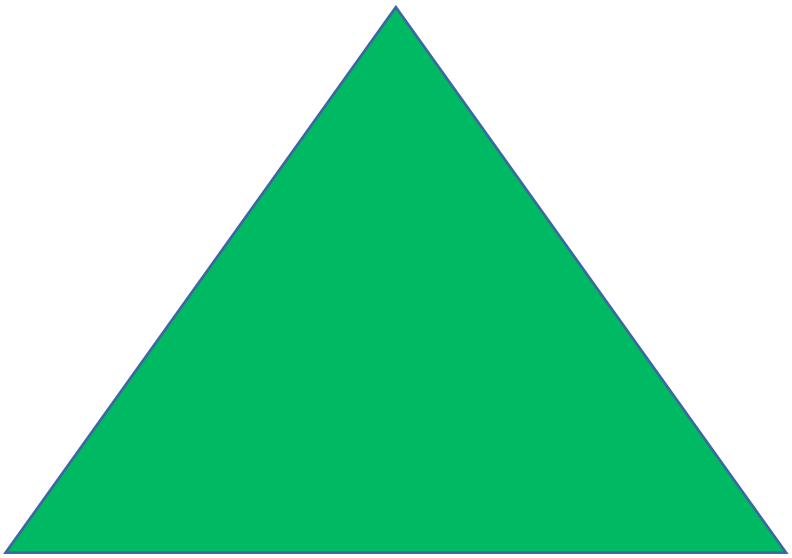
IOWA STATE UNIVERSITY
Extension and Outreach

Shape Hunt Sheet

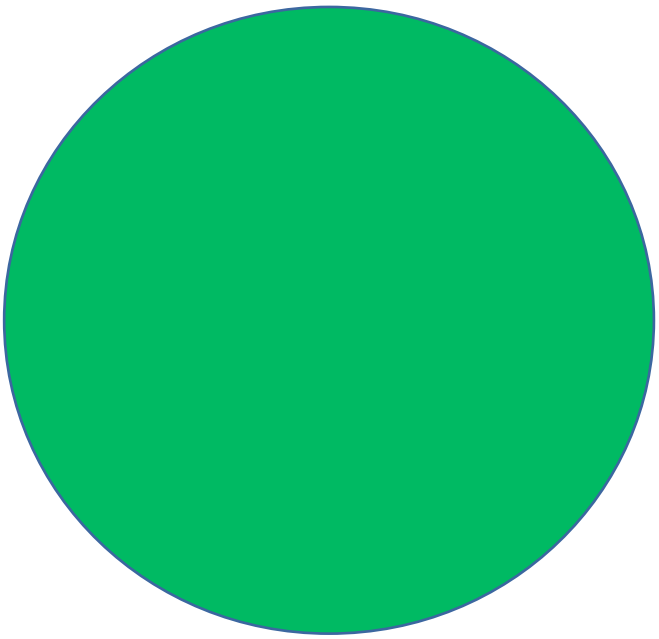
Shape Name	Example	Tally Each Time You Find One!
Square		
Rectangle		
Triangle		
Circle		
Oval		
Diamond		
Star		

Square

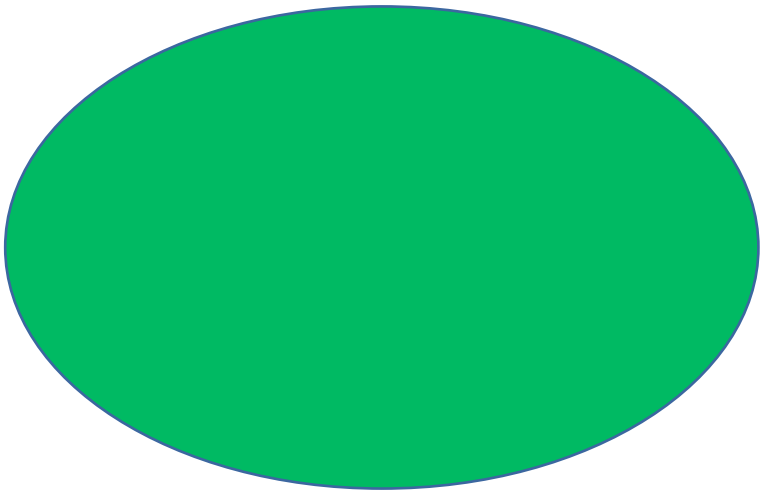
Rectangle



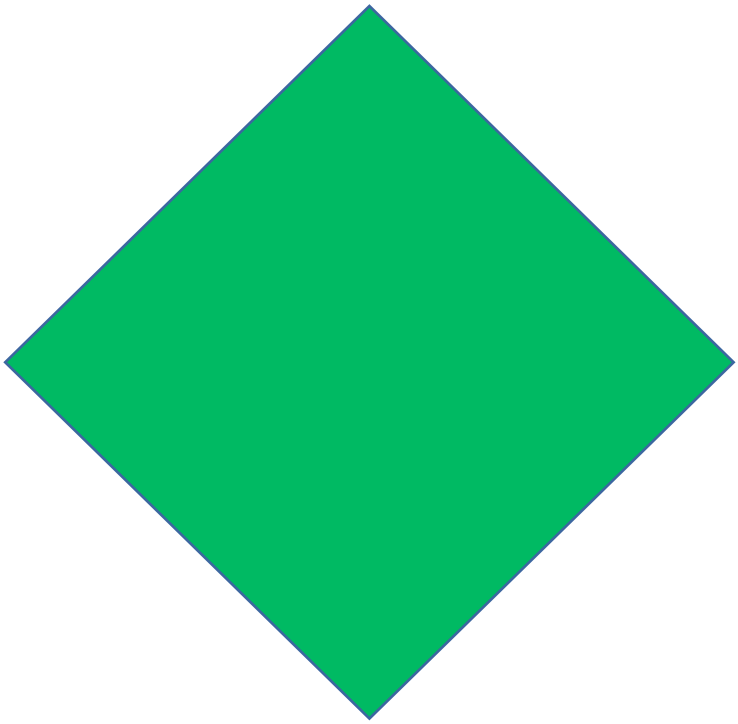
Triangle



Circle



Oval



Diamond

Star

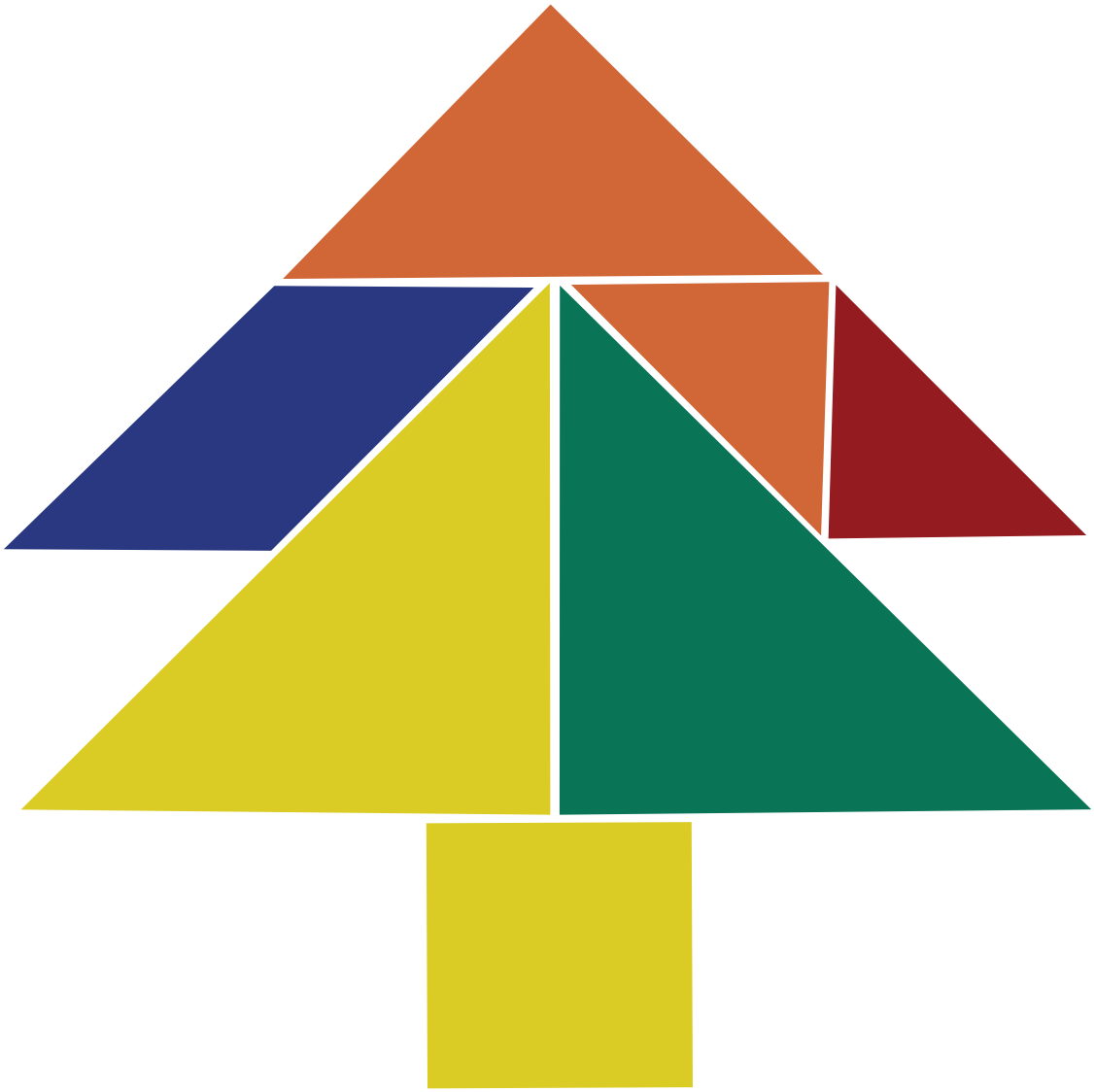
SUPER SHAPES

BIRD PUZZLE

SUPER SHAPES

FLOWER PUZZLE

TREE PUZZLE



TAKE A CHANCE!

IOWA STATE UNIVERSITY Extension and Outreach
STEM-Lit TO GO! iowa

BIG idea

Children participate in various games of chance to learn more about math concepts.

AGENDA

Pledges and Announcements

STEM-Literacy Activity

- Coin Toss
- Read Book *Probably Pistachio* by Stuart J. Murphy
- Clover Dice Game
- Gumball Game
- Read Book *That's A Possibility* by Bruce Goldstone

Healthy Snack: Dice Delight

Community Building: Create A Game

Closing: 4-H Home Connections Letter

KEY VOCABULARY

PREDICTION
a statement about what will happen or may happen in the future

CHANCE
the possibility that something will happen

POSSIBILITY
something that can happen

IMPOSSIBLE
something that can't happen

CERTAIN
something is sure to happen

LIKELY
something more likely to happen

Materials

- ❑ Coin
- ❑ Book *Probably Pistachio* by Stuart J. Murphy
- ❑ Chart Paper/Marker
- ❑ Clover Dice Game Sheet*
- ❑ Crayons/Pencils
- ❑ Dice
- ❑ Gumballs
- ❑ Bag
- ❑ Gumball Machine
- ❑ Book *That's A Possibility* by Bruce Goldstone
- ❑ Iowa Game Board*
- ❑ Materials to Create Iowa Game: Cardstock, Paper Plates, Plastic Lids, Items for Game Markers

** Included with STEM-Lit TO GO!*

Healthy Snack Ingredients

- ❑ Graham Crackers
- ❑ White Fruit Spread or Frosting
- ❑ Blueberries, Chocolate Chips, or Halved Grapes

PLEDGES AND ANNOUNCEMENTS

We encourage you to begin your Clover Kids meeting by reciting the Pledge of Allegiance, followed by the 4-H Pledge, when appropriate.

4-H Pledge

I pledge my head to clearer thinking, my heart to greater loyalty, my hands to larger service, and my health to better living, for my club, my community, my country, and my world.

STEM-LITERACY ACTIVITY

Start by flipping a coin in the air and calling out a prediction of heads or tails. Check to see if your prediction was correct. Next, ask the children to make a prediction of heads or tails with their thumbs as you flip the coin again. Share that a prediction is saying what you think may happen in the future.

Heads – Thumbs up

Tails – Thumbs down

Check to see what children predicted and discuss the result. When I tossed the coin, I could only get a heads or a tails—is that right? (yes). So there are only two possible outcomes, heads or tails. So there is a 1 out of 2 chance that I will get heads or tails—that is a pretty good chance, don't you think? Remember that chance means the possibility that something will happen.

Key Vocabulary

PREDICTION
a statement about what will happen or may happen in the future

CHANCE
the possibility that something will happen

READ ALOUD

Share that now we are going to be reading a book about a boy named Jack and listening to see what his chances are for having a good day! Introduce the book *Probably Pistachio* by Stuart J. Murphy.

Look at the cover of the book and ask children: What do you think this story may be about and why?

Next, ask: What does "pistachio" mean, or what is a pistachio? Share that a pistachio is a pale, green nut. Have you ever had a pistachio?

DURING

Ask questions to engage children with the story and support comprehension.

On page 8, the main character says that he had to copy his homework over again because it was too soggy. What can we infer happened?

Why would his paper be soggy after thinking about Emma's pastrami sandwich?

Did trading lunches with Emma work out as well as Jack had hoped? Why or why not?

What is the bubble on page 13 showing us? Why is this thought bubble important for us to see?

On page 18, Jack says, "What else can go wrong today?" Have any of you ever felt like that?

Page 27 shows a rain cloud over Jack's head. What does that symbolize? How is Jack feeling in this picture? Why?

READ ALOUD CONTINUED

AFTER

Have a discussion about the book with the children.
Who were the main characters in this story?

Jack was facing all kinds of problems in this story. What were some of them?

How did Jack's attitude change by the end of the story? What changed his attitude?

What did you think about his chances for having a good day?

HANDS-ON STEM

Clover Dice Game

Introduce the Clover Dice Game to the children. To begin, write out the following numbers and letters on chart paper for the children (see below).

Do

a. 1—C
b. 2—L
c. 3—O
d. 4—V
e. 5—E
f. 6—R

Share that each letter of the word clover correlates to a number on the die and that each time you roll the die, you have a chance of getting any of the numbers. After rolling the die, color in the matching box on the Clover Dice Sheet provided. The goal is to fill in all of the boxes or spell the word clover. Model how to roll the die and color in the matching box.

Next, share that prior to starting each group will make a prediction of how many rolls it will take them to spell out the word and record it on the sheet provided.

Then split the group into pairs and give each group a Clover Dice Game Sheet, pencil, crayons, and a die. Have fun playing the game! Remember to record the number of rolls it takes to spell the word clover.

After each group has spelled clover, discuss the number of rolls it took. Were our predictions correct?

Reflect

Apply

Were they too high or too low? If so, why do you think our predictions were too high or too low?

HANDS-ON STEM

The Gumball Game

Prior to playing the game, place 20 gumballs (10 red, 5 blue, 4 yellow, and 1 green) in a bag. The colors can be swapped if needed.

Do

1. Open the bag of gumballs and create a pie chart with the children that illustrates the number of each color in the bag. See the example provided.
2. Discuss the pie chart. Which group is the biggest, smallest?

Ask open-ended questions while children participate in STEM play.

Ask children about their ideas and listen carefully.

Encourage children to engage with the materials and try out new ideas.

Ask children to discuss the learning event with each other.

Refer back to the STEM play and any data charts during the discussion.

Ask children to discuss what they learned about the topic.

Ask children to apply what they learned to new situations.

Redesign or rebuild, incorporating what they learned.

Ask children what they learned about themselves and the STEM-literacy concepts covered.

HANDS-ON STEM CONTINUED

3. After the graphing is complete, pour the gumballs into the mini gumball machine.
4. Discuss the likelihood or the chance of getting each color of gumball. Is there a high or a low chance of getting a certain color? Why do you think that?
5. Pick a child to come up and turn the crank on the machine. Record the color that comes out, and then place the gumball back into the machine. Repeat at least 10 times.

Color	Tally if Color Comes Out Here

Discuss the results. Which color did we get the most of? The least? Based on our chan, which color do you think you would have the best chance of getting? Have there been times in your life when you didn't get the color (or the item) you wanted from a machine?

READ ALOUD

Read the book *That's A Possibility* by Bruce Goldstone to learn more about the math concepts in this agenda.

BEFORE

Introduce the book, and then ask the following question from the book, "If you roll some dice, is it possible that you will roll a five? Is it likely?
What about rolling a zero?"
What do you see on the cover of the book?
What do you think it may be about?

DURING

Track vocabulary words; multiple probability words are introduced throughout the book. Discuss the meaning of the words and allow youth to give examples. Those words include: possibility, impossible, certain, likely.
Page 3 asks, "What are some other possibilities?" What are some things that could happen to these balloons?
What is something that is impossible?
What does it mean to say that something is for certain?
Let's answer the questions on page 11, together. If one of these birds flies away, what color will it probably be? Why do you think that?
What colors are possible but not likely to fly away? Why? What colors are impossible?

AFTER

Discuss how probability can help you predict what will happen.
What's the probability that it will rain/snow tomorrow? (have a weather chart available to help predict)
What is a word I could use when saying there is no chance of something happening?
What did you think about his chances for having a good day?

Ask children to discuss the learning event with each other.

Refer back to the STEM play and any data charts during the discussion.

Ask children to discuss what they learned about the topic.

Ask children to apply what they learned to new situations.

Redesign or rebuild, incorporating what they learned.

Ask children what they learned about themselves and the STEM-literacy concepts covered.

Key Vocabulary

POSSIBILITY
something that can happen

IMPOSSIBLE
something that can't happen

CERTAIN
something is sure to happen

LIKELY
something more likely to happen

HEALTHY SNACK

Dice Delight

Give each child a graham cracker and have them break it in half. Spread white fruit spread or frosting over both pieces. Using blueberries, chocolate chips, or halved grapes, have each child create a dice face on each cracker. Enjoy!

COMMUNITY-BUILDING

Create a Game

Put the children into groups of two and give them an opportunity to create their own "game of chance." Provide each group with cardstock, an Iowa gameboard, game markers, and other random supplies. Allow time for creation, and then let each pair explain their game to the group. See a sample game on page 21 of the book That's A Possibility by Bruce Goldstone.

Spinner—Have random supplies available to create a spinner, such as small paper plates, circle lids, and paperclips. Use page 30 in That's A Possibility to model what a spinner can potentially look like.

Gameboard—Provide each group with an Iowa gameboard. Give them markers, crayons, paper, and other craft materials to add obstacles and designs to the gameboard.

Game Play—Encourage each group to create a set of instructions and rules on how to play the game.

CLOSING

Review all that was done that day, asking children to share one thing that they learned. Share reminders with group.

Home Connection

Remember to send home or email the 4-H Home Connections Letter to extend the learning and fun!

4-H CLOVER KIDS

DEAR CLOVER KIDS PARENTS AND GUARDIANS,

Today at Clover Kids, we learned about probability and games of chance. Do you know the likelihood of getting tails three times in a row in a coin toss? Can you name something that is impossible? Clover Kids learned about chance through fun and engaging activities such as:

- Reading *That's A Possibility* by Bruce Goldstone.
- Predicting gumball colors from a gumball machine.
- Creating a game!

- Probability is the chance that something will happen.
- Most games we play are games of chance, and we can try to predict the outcome.
- Math is an important part of our lives!

AT HOME

- Ask your child to make a prediction about what may be for supper, based on smells or ingredients you are using.
- Create a game together as a family. Use household items to make the board and spinner. A plastic lid, pencil, and paperclip are a great start for a spinner. A dismantled cereal box makes a great game board.
- Ask your child to challenge you in the Clover Dice Game and see who can get "CLOVER" in the least amount of rolls.

DIG DEEPER

- Check out books from the library about probability, such as ***Bad Luck Brad*** by Gail Herman or ***It's Probably Penny*** by Loreen Leedy.
- With an adult, create your own probability graph at: https://nces.ed.gov/nceskids/createagraph/
- Explore more math concepts at: http://pbskids.org/games/math/

Thank you for being a part of Clover Kids today! We look forward to seeing you at our next meeting.

Sincerely,

Your Clover Kids Leader

IOWA STATE UNIVERSITY
Extension and Outreach

TAKE A CHANCE!

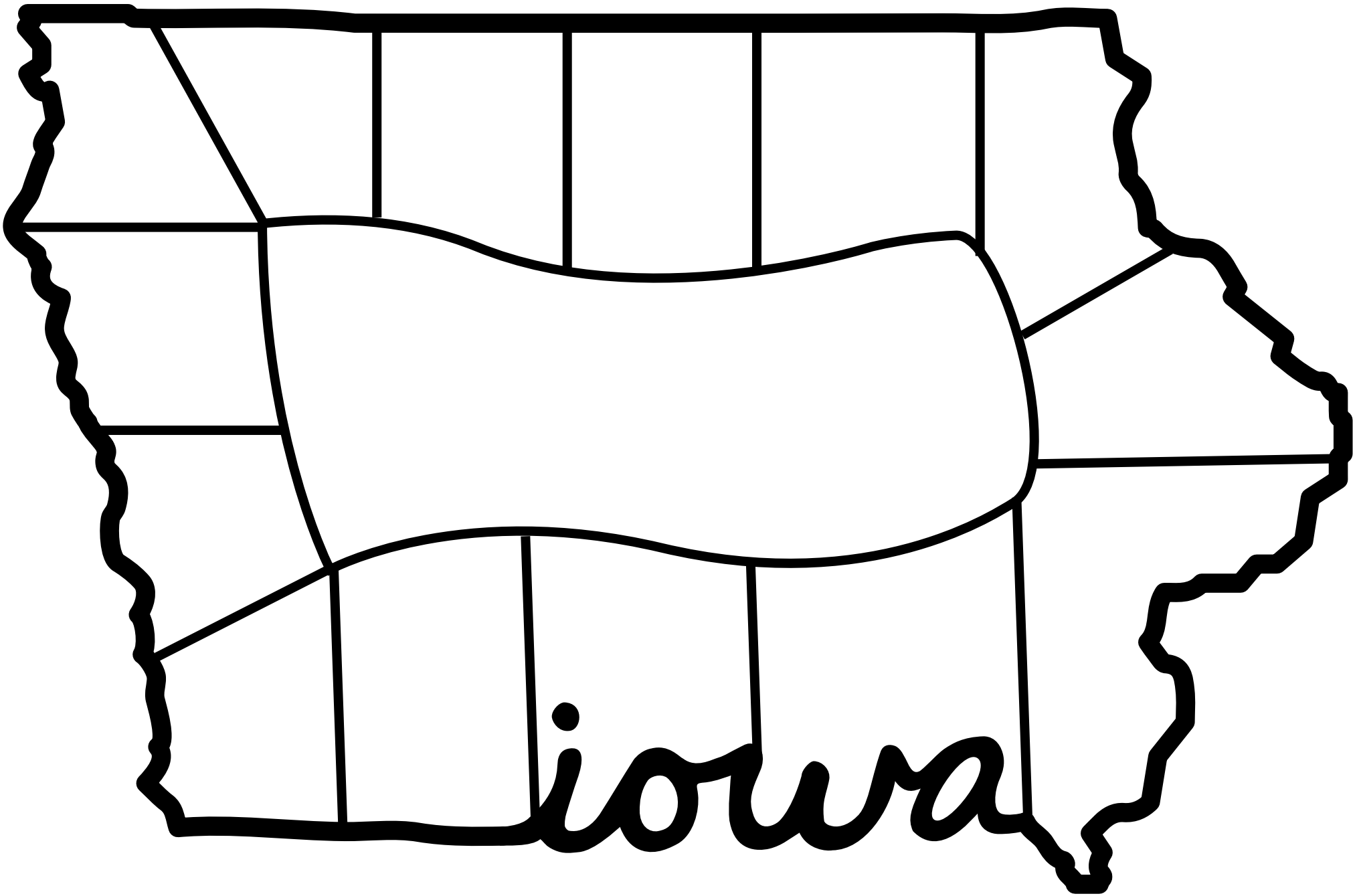
THE CLOVER GAME

1	2	3	4	5	6
C	L	O	V	E	R

How many rolls will it take to get ‘Clover?’ _____

TAKE A CHANCE!

IOWA GAMEBOARD



TRICKY TOWERS

Children participate in the engineering design process as they learn more about structures and STEM professions.

AGENDA

Pledges and Announcements

STEM-Literacy Activity

Read Book Iggy Peck, Architect by Andrea Beaty

Structure (STEM) Play & Tower Design Challenges

Showcase and Group Reflection

Iowa State University Campanile Video

Campanile Challenge

Healthy Snack: Tower Snacks

Community Building: Tower Tag

Closing: 4-H Home Connections Letter

Materials

- ❑ Structure Photos (Towers)*
- ❑ Sticky Notes
- ❑ Iggy Peck, Architect Book by Andrea Beaty
- ❑ Tower Materials: 3 Oz. Cups, Tin Foil Pie Pan, Wide Popsicle Sticks, Other
- ❑ Chart Paper
- ❑ Marker
- ❑ Campanile Photo*
- ❑ Campanile Video Link
- ❑ Technology Needed to Show Video
- ❑ Challenge Option 1: Marshmallows, Spaghetti
- ❑ Challenge Option 2: Tower Template, Crayons, Scissors, Pencils, String, Pipe Cleaners, Bells, Paper, Binder Clips

** Included with STEM-Lit TO GO! Lesson Plan.*

KEY VOCABULARY

ARCHITECT
Someone who designs buildings and may focus the building

ENGINEER
Someone who designs and builds a building and focuses on the structure

STABLE
Not easily moved

STRUCTURE
A building or other object constructed from several parts

Healthy Snack Ingredients

- ❑ Cheese Cubes
- ❑ Pretzel Sticks
- ❑ Other Stackable Snack Items

PLEDGES AND ANNOUNCEMENTS

We encourage you to begin your Clover Kids meeting by reciting the Pledge of Allegiance, followed by the 4-H Pledge, when appropriate.

4-H Pledge

I pledge my head to clearer thinking, my heart to greater loyalty, my hands to larger service, and my health to better living, for my club, my community, my country, and my world.

STEM-LITERACY ACTIVITY

Show a variety of structure photos to the children. Here are some examples: http://www.sciencekids.co.nz/pictures/structures.html

Read the name of the structure and share facts with the children.

Which one is your favorite? Why?

Hand out a sticky note to each child and conduct a sticky note vote with the children. Have them place their sticky note on or around a favorite photo.

Discuss the results and determine which structure was the group's favorite.

What does the word structure mean?

Have the children share their ideas with you.

If needed, share that the word "structure" has multiple meanings; however, for today, we are going to say that structure means a building, or other object constructed from several parts.

Key Vocabulary

STRUCTURE
a building or other object constructed from several parts

What are some structures that we can see around us right now? Or what are some structures in our town?

Share that we are now going to read a story about a young boy that loves to build structures. Some of the structures are made from some pretty funny parts.

READ ALOUD

Read the book *Iggy Peck, Architect* by Andrea Beaty.

BEFORE

Ask children if they know what an architect is. If not, share these child-friendly definitions:
What do you call someone who designs buildings and may focus on the look and feel of the building? (architect)
What do you call someone who designs and builds a building and focuses on the structure? (engineer)

Key Vocabulary

ARCHITECT
a person who designs buildings

ENGINEER
someone who designs and builds a building and focuses on the structure

DURING

Ask children to pay attention to the different structures that Iggy builds. In particular, ask students to pay attention to what Iggy builds with, in the book.

AFTER

Ask the children questions. A few examples are provided below:
What was your favorite structure that Iggy built?
What was the problem in the story? How did the character try to solve the problem?
What were the most important events in this story?

HANDS-ON STEM

Now it is our turn to build, just like Iggy!

Bring out the tower-building materials (cups, pie pan, and sticks) and show them to the children.

Share that we are going to work to meet different challenges to learn more about what is needed to build a strong, stable structure.

Begin with the following challenges with the provided materials:

1. Build the tallest (or widest) structure you can.
2. Build a structure that rests on or is supported by one cup (or other object).
3. Build a structure that is two feet tall but uses the fewest materials.
4. Build a structure that can hold _____ (you provide object) placed on the top.
5. Build a structure that has a "shelf" part way up to hold _____ (you provide object).
6. Other challenges that you and the children design together.

Take notes and/or photos to help the discussion after each challenge is completed; this task may be great for an older child. A sample data collection table is shown below.

Design Challenge #	Picture/Drawing of Structure	Notes
#1	(insert photo)	(insert notes)

Gather the group together to discuss the different structures that were built. Read through the information on the chart and reflect on the data collection table together. Try to answer the following questions:

1. What was important for having a stable structure?
2. What did you learn about structures from our work? Is there an example on the chart that provides evidence or backs up what you are saying? (For this question, it may be good for the adult leader to share a model first: I think…because…)

Show the Campanile Photo Page to the children.

Ask the children: Has anyone seen this tower/structure before?

If so, have children share their experiences.

If not, share that the tower is located at Iowa State University and plays a special role on campus.

Ask the children: Does anyone know what is special about this tower? Listen to ideas and then play the Campanile video.

Play the Campanile video.
https://www.youtube.com/watch?v=0TabHVwGRA4#action=share

BEFORE — Before viewing the video, ask the children to listen and watch for fun Campanile facts.

DURING — During the video, stop as needed to point out details to the children.

AFTER — After viewing the video, ask children to share one fun fact about the campanile. Write down those facts on a large piece of chart paper.

Key Vocabulary

STABLE
not easily moved

Do

- Ask open-ended questions while children participate in STEM play.
- Ask children about their ideas and listen carefully.
- Encourage children to engage with the materials and try out new ideas.

Reflect

- Ask children to discuss the learning event with each other.
- Refer back to the STEM play and any data charts during the discussion.
- Ask children to discuss what they learned about the topic.

Apply

- Ask children to apply what they learned to new situations.
- Redesign or rebuild, incorporating what they learned.
- Ask children what they learned about themselves and the STEM-literacy concepts covered.

CHALLENGE

Challenge Option 1: Ask the children to build a tower modeled after the Campanile with spaghetti and marshmallows that is two feet tall (or higher). Encourage them to think about what they have learned about structures and apply it to this new situation when building. Be sure to share that the spaghetti can be broken into pieces to help with the building process.

Challenge Option 2: Share the cardstock Campanile template with the children. Model for children how to cut out the Campanile template. Allow time for children to color/decorate the papers, encouraging them to focus on the look and feel of the building. Tape the building together and make sure that it is able to stand on its own when done cutting and coloring. If time is limited, print the template on colored cardstock and cut in advance. Then present the following note to the group.

The people that care for the Campanile need your help! They need to get a new bell to the top of the bell tower. We need you to design a way for the bell to get to the top, using only the materials provided. Show the additional challenge materials to the children. Those materials include pencils, string, pipe cleaners, bells, paper, and binder clips. You may want to define the challenge more by sharing that groups must use a certain number of materials. Good luck!

When done with either challenge, have the children present their towers to the group. If option two is chosen, have the children also showcase their bell lifter. Be sure that each group has a chance to give a small presentation. Take a photo of the towers and share them with Iowa 4-H Clover Kids!

Helpful Hint

Watch a step-by-step video for guidance!
https://youtu.be/QfNBKHGJzfw

HEALTHY SNACK

Tower Snacks

Provide children with a stackable snack such as cheese cubes and pretzel sticks. Remind children to wash hands before stacking and eating their snacks.

COMMUNITY BUILDING

Tower Tag!

Play this version of freeze tag with your group. To begin, define the borders of the tag area. Pick one person, or two, to be it. The "it" person goes around trying to tag others. Once tagged, children need to stand still or freeze like a tower; another child then needs to unfreeze him/her.

Freeze/Unfreezing variations: Ring a bell (like the campanile) to unfreeze, freeze like a leaning tower, freeze like a short tower and more!

Home Connection

Remember to send home or email the 4-H Home Connections Letter to extend the learning and fun!

CLOSING

Review with the children some key vocabulary such as "architect" and "structure". If the Campanile template was not used earlier, consider sending it home with the group.

4-H CLOVER KIDS

DEAR CLOVER KIDS PARENTS AND GUARDIANS,

Today at Clover Kids, we learned about both being an architect and about the Iowa State University Campanile! Did you know that the tower has a total of 50 bells? Clover Kids learned about architecture and engineering through fun and engaging activities such as:

- Reading *Iggy Peck, Architect* by Andrea Beaty.
- Participating in an engineering design challenge to help get a new bell to the top of the tower.
- Watching a video on how the tower bells are taken care of and played.

- An architect is someone that designs buildings and may focus on the look and feel of the building.
- An engineer is someone that designs and builds a building and focuses on the structure.
- Being creative is an important part of Science, Technology, Engineering, Mathematics (STEM) career fields.

AT HOME

- Buy a package of small plastic cups. Have fun stacking the cups and building different structures.
- Read other books written by Andrea Beaty, such as *Rosie Revere, Engineer* or *Ada Twist, Scientist*. Check your local library to see if they may have these books for checkout!
- Use spaghetti and marshmallows to build fun structures.

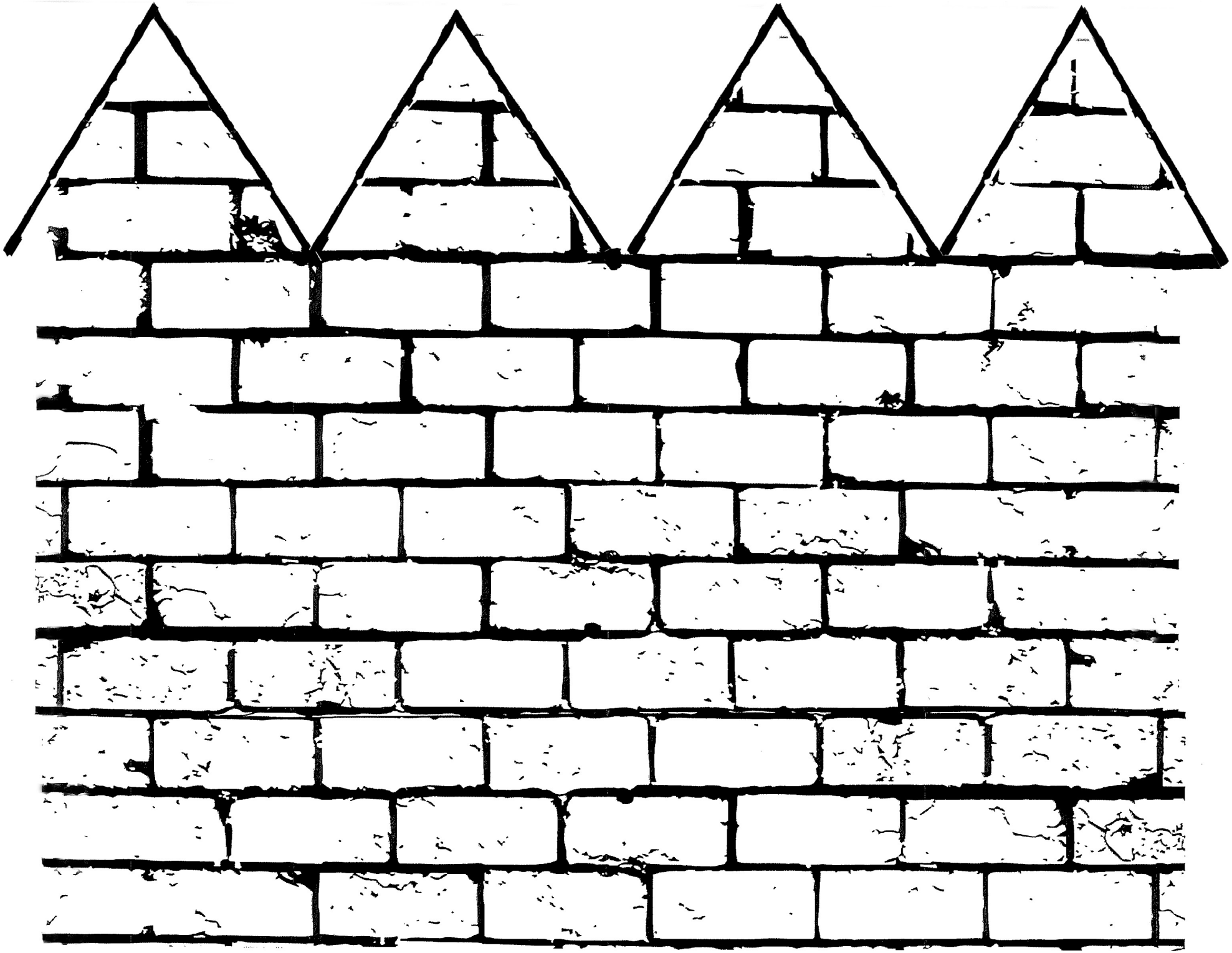
DIG DEEPER

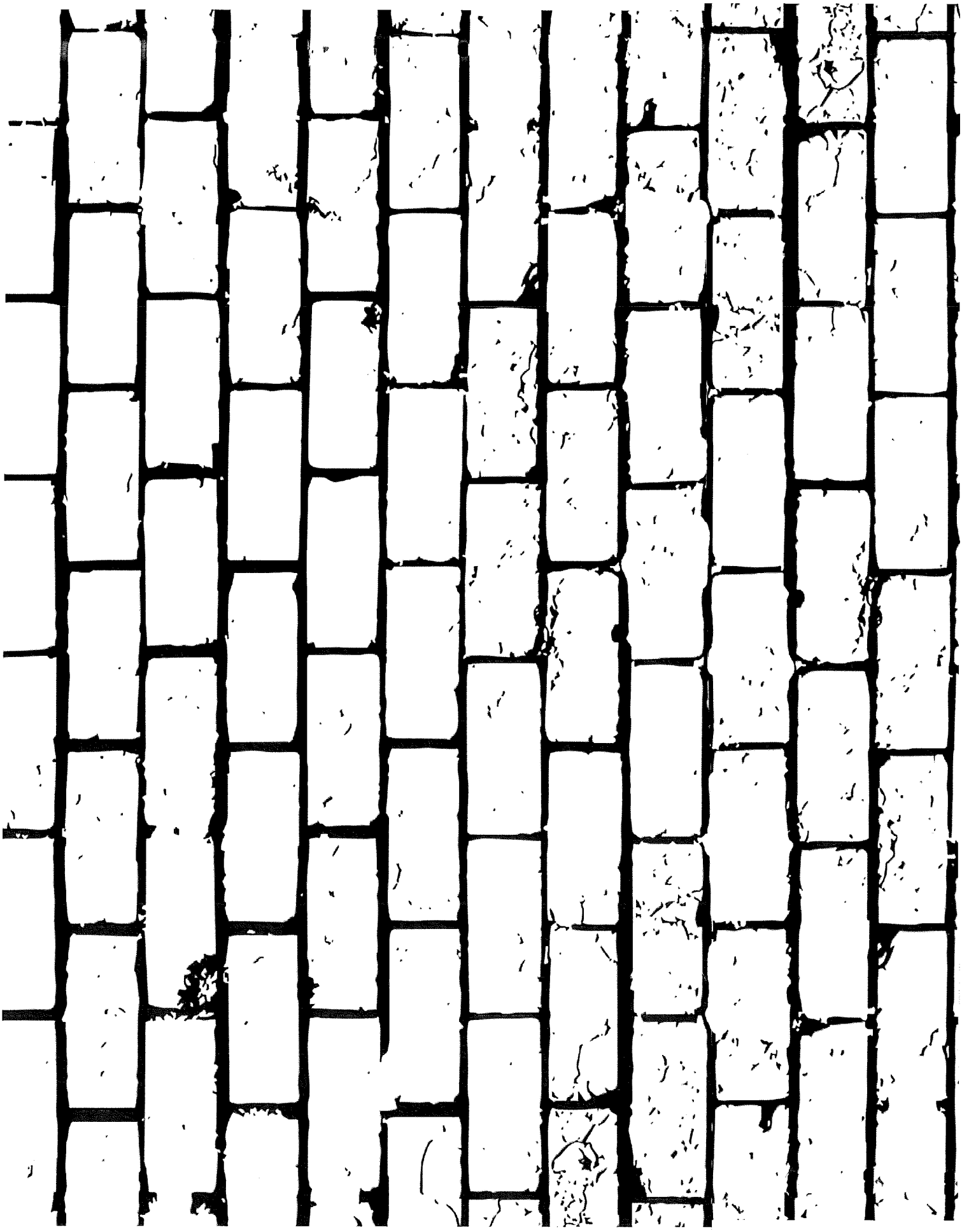
- Learn more about being an architect:
  - Older youth: https://www.youtube.com/watch?v=DkJLbCCI6Zs
  - Younger youth: https://www.youtube.com/watch?v=zvewCudtFZs&t=108s
- Learn more about being an engineer: https://www.nationalgeographic.org/media/nasa-kids-intro-engineering/

Thank you for being a part of Clover Kids today! We look forward to seeing you at our next meeting.

Sincerely,

Your Clover Kids Leader





IOWA STATE UNIVERSITY CAMPANILE

WONDERS OF NATURE

Iowa State University Extension and Outreach
STEM-Lit TO GO! iowa

BIG idea

Children learn about natural resources and the importance of environmental conservation.

AGENDA

Pledges and Announcements

STEM-Literacy Activity

Read Book *Creekfinding: A True Story* by Jacqueline Briggs Martin

Birdwatching

Bird Feeder Cookies

Read Book *Goldfinches* by Lisa Amstutz

Healthy Snack: Bird Food

Community Building: Crows and Cranes

Closing: 4-H Home Connections Letter

KEY VOCABULARY

CREEK
a small stream

HABITAT
the place or type of place where a plant or animal naturally or normally lives or grows

CONSERVATION
the protection of animals, plants, and natural resources

Materials

- ❑ Book *Creekfinding: A True Story* by Jacqueline Briggs Martin
- ❑ Clipboards
- ❑ Paper/Pencils
- ❑ Bird Seed
- ❑ Cookie Cutter or Jar Ring (1 Per Child)
- ❑ Unflavored Gelatin
- ❑ Cold Water
- ❑ Boiling Water
- ❑ Yarn or String
- ❑ Drinking Straw
- ❑ Non-stick Cooking Spray
- ❑ Book *Goldfinches* by Lisa Amstutz

** Included with STEM-Lit TO GO!*

Healthy Snack Ingredients

- ❑ Sunflower Seeds
- ❑ Gummy Worms
- ❑ Goldfish

PLEDGES AND ANNOUNCEMENTS

We encourage you to begin your Clover Kids meeting by reciting the Pledge of Allegiance, followed by the 4-H Pledge, when appropriate.

4-H Pledge

I pledge my head to clearer thinking, my heart to greater loyalty, my hands to larger service, and my health to better living, for my club, my community, my country, and my world.

STEM-LITERACY ACTIVITY

Begin a discussion about the outdoors with the children.

Do you have a favorite place to go outside? Have you ever visited a place with a creek or small river? If so, what did you notice or like about those places?

Share that today we are going to read a story about a man named Mike who went looking for a creek that had been buried under fields of corn in northeast Iowa.

Key Vocabulary

CREEK
a small stream

READ ALOUD

Read the book *Creekfinding: A True Story* by Jacqueline Briggs Martin. Be sure to share that she lives in Iowa.

BEFORE

Ask the children more questions about creeks.
What animals do you think live in or near a creek?
What kind of plants or animals did you see when you were at the creek?
Are creeks important? Why or why not?

DURING

Ask children:
How do you think excavators and big machines can find a lost creek?
How do you think the creek got lost?
Point out the text found within the illustrations.

AFTER

Hold a discussion about habitats and environmental conservation.
The author wrote, "Brook Creek isn't just water." What do you think that means? Brook Creek is a habitat for many animals. A habitat provides the food, water, and shelter that animals need to survive. Different species need different kinds of habitats.
What were some of the animals that lived at Brook Creek? Insects, trout, frogs, and birds.
How did the trout get in the creek? Trucks brought the trout in tubs of water.
Why do you think it was so important to Mike that he restore the creek, even though others laughed and said his plan was foolishness? Mike understood the importance of conservation.
How can you take care of our environment?

Key Vocabulary

HABITAT
the place or type of place where a plant or animal naturally or normally lives or grows

CONSERVATION
the protection of animals, plants, and natural resources

HANDS-ON STEM

Birdwatching

There were many animals that lived at Brook Creek—including birds!

Do

We don't have to go to a creek to enjoy birdwatching.

Where else can we see birds? We can see birds in our neighborhoods, parks, and even our own backyards. Today we are going on a bird-watching walk!

Provide children with a clipboard, pencil, and paper. In pairs, have children tally the number of birds they see as they go on a bird-watching walk.

Have the children fold their paper into thirds. In the first section, children can tally how many birds they see flying. In the middle of the paper, children can tally how many birds they see walking. In the last section, children can tally how many birds they see sitting.

Ask open-ended questions while children participate in STEM play.

Ask children about their ideas and listen carefully.

Encourage children to engage with the materials and try out new ideas.

Optional

Allow each pair of children to take a picture of a bird. Once the group returns inside, they can work together to identify the birds in the photos, using the following bird identification website. https://www.allaboutbirds.org/guide/browse/shape

Reflect

Graph the number of birds one group noted on their hike. Create three columns (flying, walking, and sitting) on a bar graph. Then use sticky notes to graph the number of birds observed by that pair. Have the other children compare their numbers to the data on the chart. What was the same or different?

Discuss other aspects of the walk with the group.

Where did you see birds?

Why do you think they were in that location?

What did you observe the birds doing?

Could you identify any of the birds?

Ask children to discuss the learning event with each other.

Refer back to the STEM play and any data charts during the discussion.

Ask children to discuss what they learned about the topic.

Apply

We observed the birds in our community today. How could we improve the habitat for birds in our community? Examples include bird feeders, bird baths to provide birds access to water for drinking and bathing, bird houses, and planting plants and shrubbery.

Ask children to apply what they learned to new situations.

Redesign or rebuild, incorporating what they learned.

Ask children what they learned about themselves and the STEM-literacy concepts covered.

Optional

Citizen science provides an opportunity for children and adults to study the world around them and record the data they collect to help scientists with their research. Anyone can do citizen science!

Sign up for a free eBird account at https://ebird.org/home. Help scientists by recording the birds identified on the bird-watching walk. If time allows, explore the site to learn about birds that have been identified in Iowa and other parts of the United States.

HANDS-ON STEM

Birdfeeder

Now that we know how to improve bird habitats, we are going to make bird feeders that you can take home to attract birds to your backyard or neighborhood. Split the children into small groups. Allow each group to assist with mixing the ingredients below.

*Note: For the safety of the children, you will need at least one adult with each small group.

Each child will spray their cookie cutter or jar ring with non-stick spray to make the birdseed cookies easier to pop out. Children may need to take these home if the birdseed cookie is not ready to pop out before they leave.

Empty 1 package of unflavored gelatin into a bowl with 2 tablespoons of cold water. Let this sit for 1 minute. Add 1/3 cup of boiling water to the gelatin, stirring for a few minutes or until the gelatin is dissolved. This is the binder that keeps seeds together.

Next, add 2 cups of bird seed to the gelatin and allow the children to take turns mixing thoroughly.

On a tray or sheet of wax paper, lay out the cookie cutters or jar rings. Have the children fill the cookie cutters with the mixture and press into shape firmly. Using a drinking straw, make a small hole in each birdseed cookie for the string.

Finally, refrigerate the birdseed cookies for a few hours to allow the seed mixture to firm. Once the birdseed cookies are firm, warm to room temperature, and then carefully pop the birdseed cookies out of their molds and tie the string though the hole.

Materials (per group)

- ❑ 2 cups bird seed
- ❑ Cookie Cutter or Jar Ring (1 Per Child)
- ❑ 1 Packet Unflavored Gelatin
- ❑ 2 Tablespoons Cold Water
- ❑ 1/3 Cup Boiling Water
- ❑ Yarn or String
- ❑ Drinking Straw
- ❑ Non-stick Cooking Spray

Optional

Seed Bombs

Children can make seed bombs by following these step-by-step instructions, https://littlebinsforlittlehands.com/make-seed-bombs-earth-day-activity/. Encourage children to share the importance of environmental conservation by giving their seed bomb to a friend or family member.

READ ALOUD

Read the book *Goldfinches* by Lisa Amstutz.

BEFORE **Ask children to discuss the differences (color, size, markings) of the birds they saw on their walk.**
If needed, look at the photos that the group took on their bird-watching walk. Share that we are now going to learn more about Iowa's State Bird, the Eastern Goldfinch. The males are very colorful—yellow and black—and easy to spot! While I read, listen for information about the Goldfinches' habitat and diet.

DURING **Point out the features of the non-fiction text with the children. Review vocabulary listed in the glossary on page 22.**

AFTER **Discuss what was learned about the habitat and diet of Goldfinches. Tie the discussion to concepts learned earlier.**
Based on what we read, do you think the Goldfinch will visit our bird feeder? Why or why not?

HEALTHY SNACK

Bird Food

Just like us, not all birds like the same foods. Different species of birds eat different kinds of food. Can you tell me what birds eat? List ideas on chart paper. (seeds, nuts, cracked corn, insects, worms, fish, fruit)

Today we are going to eat like birds! Our snack is sunflower seeds, gummy worms, and goldfish.

Optional

Give the children different-shaped "beaks" for eating! Beak ideas include clothespins, tweezers, straws, and spoons. See if you can find photos of birds that have beaks similar to the items provided. For example, the straw could be a model of a hummingbird beak. Which beak worked the best? Did it work well for all of the foods you tried to eat?

COMMUNITY-BUILDING

Crows and Cranes

Divide the children into two equal teams. One group of children will be Crows; the other group will be Cranes. Arrange the teams in two lines facing each other, with a piece of rope down the middle of the two lines of children to divide the teams. In addition, designate two home bases, one behind each team.

The leader stands at the center of one end of the two lines so all players can see and hear him/her. The leader calls out Crows or Cranes.

If Crows are called, the Cranes must turn and run a short distance to their base before the Crows tag them. If any Cranes are tagged, they become Crows and head to the other side for another round. The same applies when Cranes are called.

Play until everyone is on one side or until the group is ready to stop playing.

CLOSING

Review with the children key vocabulary such as "habitat" and "conservation." Ask the children to share one thing they can do to help protect the environment.

Home Connection

Remember to send home or email the 4-H Home Connections Letter to extend the learning and fun!

4-H CLOVER KIDS

DEAR CLOVER KIDS PARENTS AND GUARDIANS,

Today at Clover Kids, we learned about the value of natural resources and the importance of environmental conservation. We also learned about backyard birds and their habitats. Did you know that the state bird of Iowa is the Eastern Goldfinch?

Clover Kids learned about natural resources through fun and engaging activities such as:

- Reading the book *Creekfinding: A True Story* by Jacqueline Briggs Martin.
- Exploring nature through birdwatching.
- Making bird feeders to attract birds to their own neighborhood.

- Conservation is important to preserve natural resources so they will be around in the future.
- Everyone can make a difference!
- Anyone can be a scientist though Citizen Science.

AT HOME

- Use recycled materials to make a birdhouse or birdbath.
- Go on a creek walk and identify the plants and animals that live in or near the creek.
- Check out opportunities provided through your local county conservation programs.

DIG DEEPER

- As a family, participate in citizen science by signing up for a free eBird account at https://ebird.org/home. After birdwatching, record your data to help real scientists with their research.
- Learn about water conservation on the Water Rocks! website https://www.waterrocks.org/.
- Check out books from the public library about conservation.

Thank you for being a part of Clover Kids today! We look forward to seeing you at our next meeting.

Sincerely,

Your Clover Kids Leader

IOWA STATE UNIVERSITY
Extension and Outreach