4-H LEGO®
Engineering Club

Cloverbuds (ages 5–7)

MISSISSIPPI STATE UNIVERSITY™
EXTENSION

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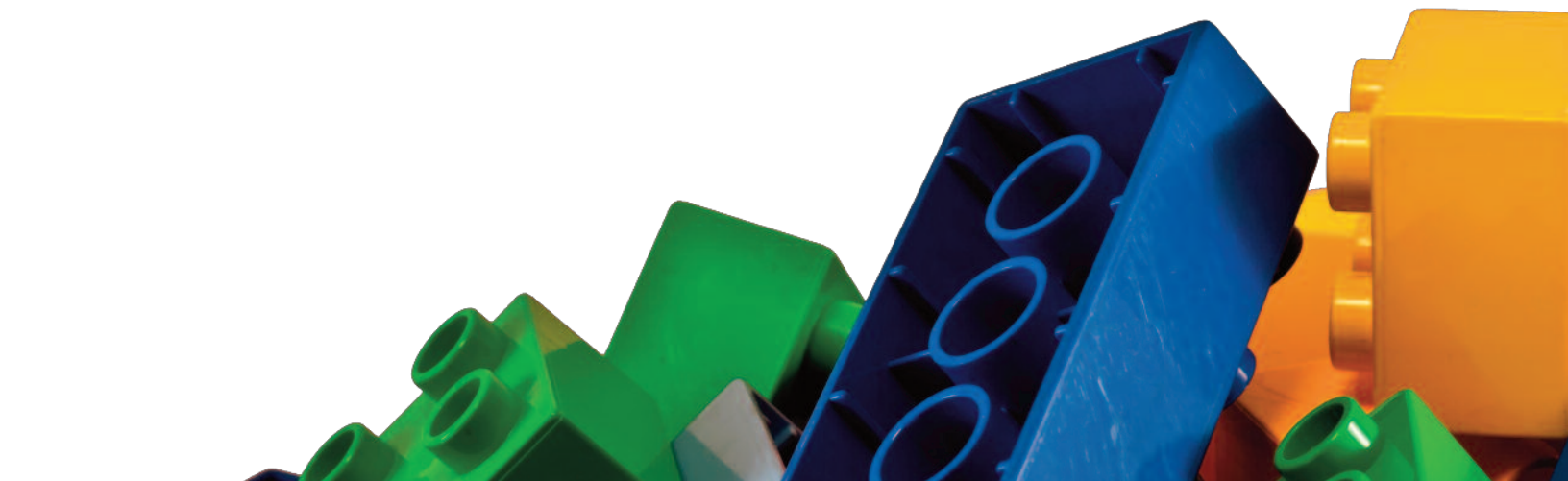
MISSISSIPPI STATE UNIVERSITY™
CENTER FOR
COMMUNITY-ENGAGED LEARNING

CONTENTS

Visit ***https://extension.msstate.edu/4-h-lego-engineering-club*** to download 4-H LEGO Engineering Club certificates and name tags!



INTRODUCTION

A 4-H LEGO Engineering Club is a building block to promote science, technology, engineering, and mathematics (STEM) at an introductory level. The 4-H LEGO Engineering Club will offer Extension agents an opportunity to incorporate STEM programming and provide 4-H'ers with the tools to be creative with engineering. Purposeful play with LEGOs allows children to engage using their HEAD to think mechanically, their HEART to be imaginative, and their HANDS to create. All of these together help improve young people's social and emotional HEALTH through active collaboration with others.

Each lesson has a different theme to engage young people in a variety of building challenges. According to Dorothy Singer, a senior research scientist at Yale University's Department of Psychology and Child Study Center, "It also lays a foundation for logical mathematical thinking, scientific reasoning, and problem solving." LEGO clubs form a solid foundation that makes it easy to move from simple builds into robots, computer coding, and beyond.

The 4-H LEGO Engineering Club curriculum consists of six lessons designed for 4-H Cloverbuds (ages 5–7). Each lesson is aligned with Next Generation Science Standards; 4-H Science and General Common Measures; and Mississippi College and Career Readiness Math, Language Arts, and Writing Standards. Each lesson also uses the Experiential Learning Model to teach life skills. Each lesson takes approximately 1 hour to complete. This curriculum could be implemented in two half-day sessions or six 1-hour sessions.

The facilitator will conclude each lesson by having participants share their projects orally, write a reflection, or create a drawing of their project. Facilitators may also post pictures of young people with their projects and a brief description of the outcome on their Facebook page with parental permission. (See photo release form on page 29.)

- **Amazing Mazes** challenges young people to create a marble maze that includes turns, tunnels, and dead ends to make the maze difficult to navigate.
- **Monster Mash** challenges young people to combine their ideas to create an elaborate monster. They use reasoning skills and their imaginations to create a scenario of the purpose of their creation.
- **Picture Puzzles** challenges young people to design a picture and then use LEGOs to turn their picture into a puzzle.
- **Tall Towers** challenges young people to construct the tallest LEGO tower.
- **Building Bridges** challenges young people to build the bridge that can withstand the most pennies.
- **Safe Ships** challenges young people to design a ship that can take two passengers across the ocean during a hurricane.

Lesson 1: Amazing Mazes (60 minutes)

Goal

Use LEGOs to collaborate with peers and learn basic engineering design principles.

Objective

Create a LEGO maze that a marble can pass through.

4-H Cloverbud Measures

4-H'ers will gain self-confidence by participating in activities, asking and answering questions, and interacting with others.

4-H'ers will experience inclusive environments by participating in cooperative learning opportunities and engaging in the curriculum.

4-H'ers will experience opportunities for mastery/competence.

Next Generation Science Standards

K-2-ETS1-2: Developing and Using Models. Modeling in K-2 builds on prior experiences and progresses to include using and developing models that represent concrete events or design solutions. Students develop a simple model based on evidence to represent a proposed object or tool.

Mississippi CCR Standards for Science—Science and Engineering Practices
Ask questions and define problems.
Develop and use models.
Evaluate and communicate information.

Mississippi College and Career Readiness Standards
S.L.K.3: Ask and answer questions in order to seek help, gather information, or clarify something that is misunderstood.
S.L.K.3: Speak audibly and express thoughts, feelings, and ideas clearly.
W.K.2: Use a combination of drawing, dictating, and writing to compose informative or explanatory texts in which they name what they are writing about and supply some information about the topic.

AMAZING MAZES
What is a maze? A path or tunnel in which it is easy to get confused. A maze is similar to a puzzle. A maze has an entrance and an exit. A person has to navigate (find their way) through to get to the exit.

Agent Preparation
Purchase materials listed below and have a cardboard maze set up before participants arrive.

Materials/Resources
- LEGOs. The number of LEGOs you need will depend on the size of your club, but, generally, a minimum of 100 pieces per child is a good starting point. The most important things are basic bricks, larger baseplates, people, and wheels. All these items can be found in bulk on the LEGO website (***http://shop.lego.com***). Purchasing small bins is also a good idea because, when you host a club, you can have two to three young people working from each bin.
- Marbles. Marbles can be any size. Each group will need one marble.
- Small game mazes. See ***http://bit.ly/2eRC6E0*** for one purchasing option.
- Cheese cubes and rectangular crackers
- The book or audio *Who Moved My Cheese? for Kids* by Spencer Johnson (ISBN 10:03999240160)
- Cardboard boxes (about 25 boxes at least 30-by-30 inches; Walmart or Lowe's will donate)
- Duct tape (two rolls)
- Scissors (two adult pair)
- Flashlights (one for every two participants)
- ENTER and EXIT signs

1. Introduction

- Have the cardboard maze set up for young people to explore when they arrive. Place an ENTER sign at the beginning of the maze and an EXIT sign at the end of the maze.
- Assess prior knowledge of mazes by asking young people questions. What is a maze? A maze is a path. A maze is kind of like a puzzle. A maze sometimes has different paths, and you have to choose the right path in order to reach the goal. Your goal in a maze is the EXIT. Ask young people to explain the meaning of "ENTER" and "EXIT." Enter—to come in; exit—to go out.

2. Exploration

Allow young people to work independently or in groups, and challenge them to create a LEGO maze that a marble can travel through. Encourage them to include turns, tunnels, and dead ends to make the maze difficult to navigate.

3. Sharing

Allow 4-H'ers to share their designs with other young people. Ask the other 4-H'ers if they have any ideas on how to make the maze more difficult.

Example questions:

Are there any places in your maze you could make a dead end?

Could you add a turn anywhere in your maze?

Is there only one way to EXIT your maze?

*Ask a senior 4-H member to model an oral presentation for the Cloverbuds to show them proper presentation skills.

4. Generalizing

Give Cloverbuds the opportunity to share where they might have seen a maze before (examples: corn maze, county fair, movie ticket line, livestock pens). They may also share types of technology games they play that are similar to mazes.

5. Application

Read aloud *Who Moved My Cheese?*, and ask participants to share why it is important to work their way through obstacles and challenges.

Example questions:

Have you ever had to go through a change in your life, kind of like a maze, where you didn't know where you would end up?

Have you ever had to move to a different school or neighborhood or be on a ball team that your friends weren't on?

Have you ever gone on vacation to a place you had never been before?

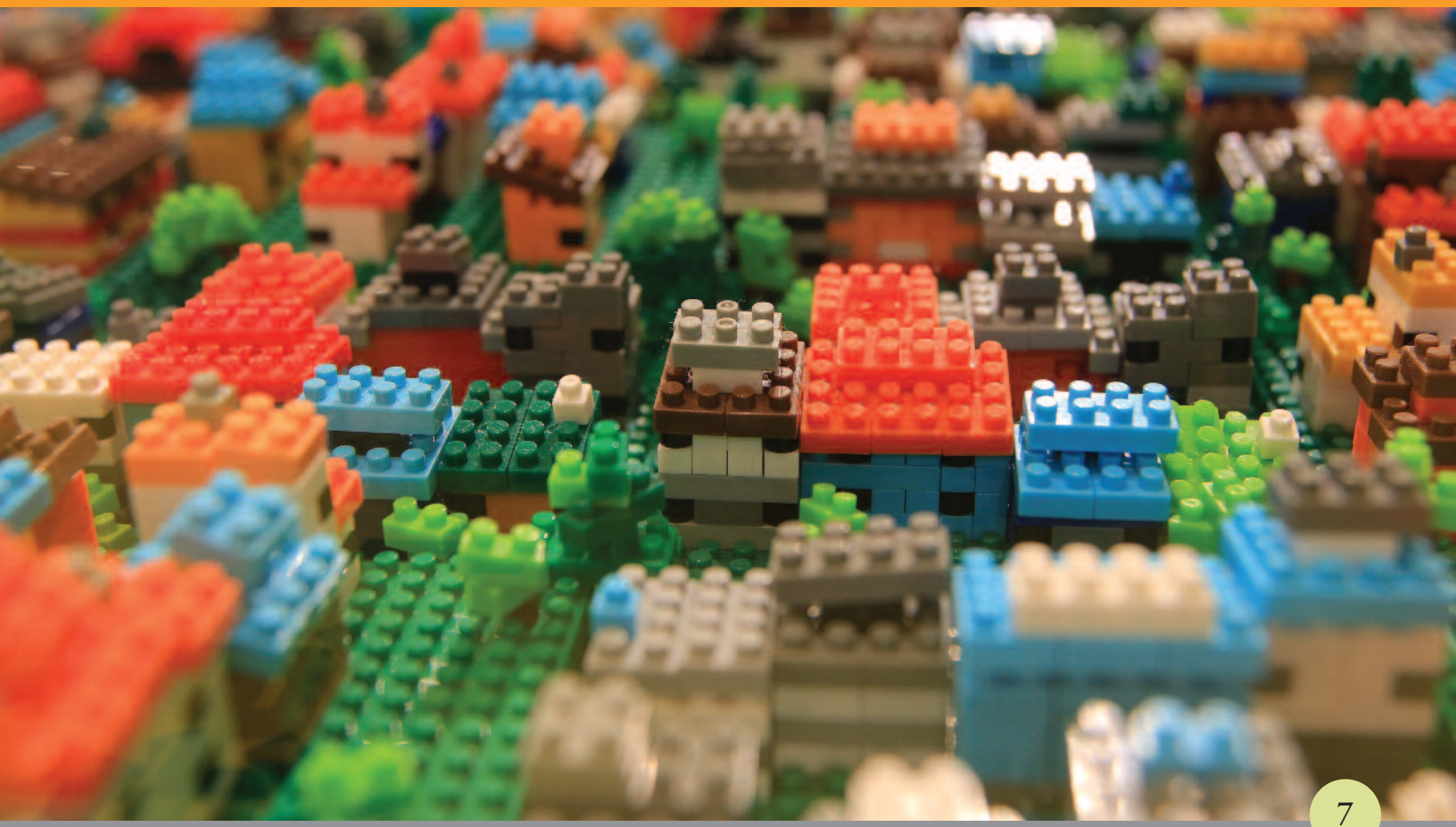
You can think of some of those experiences as mazes because you were trying to find what was at the end. Remember to stay positive just like Hem and Haw did.

6. Assessment

Complete an evaluation for the lesson. (See page 24.)

7. Conclusion

- Let participants make edible LEGOs with cheese and crackers.
- Let participants solve the clover maze activity on page 30.
- As an optional activity, you could let participants explore games or create their own mazes.



Lesson 2: Monster Mash (60 Minutes)

Goal

Young people will use LEGOs to develop creativity skills.

Objective

Young people will use team-building skills to combine ideas to create a unique (one-of-a-kind) monster.

4-H Cloverbud Measures

4-H'ers will gain self-confidence by participating in activities, asking and answering questions, and interacting with others.

4-H'ers will experience inclusive environments by participating in cooperative learning opportunities and engaging in the curriculum.

4-H'ers will experience opportunities for mastery/competence.

Next Generation Science Standards

K-2-ETS1-2: Developing and Using Models. Modeling in K-2 builds on prior experiences and progresses to include using and developing models that represent concrete events or design solutions. Students develop a simple model based on evidence to represent a proposed object or tool.

Mississippi CCR Standards for Science—Science and Engineering Practices

Ask questions and define problems.

Develop and use models.

Evaluate and communicate information.

Mississippi College and Career Readiness Standards

W.K.1, W.1.2: Use a combination of drawing, dictating, and writing to compose informative or explanatory texts in which they name what they are writing about and supply some information about the topic.

SL.K.5, SL.1.5: Add drawings or other visual displays to descriptions as desired to provide additional detail.

SL.K.6: Speak audibly and express thoughts, feelings, and ideas clearly.

MONSTER MASH

Are monsters real or imaginary? Imaginary.

Is it good to have an imagination? YES!

How many of you have heard of Albert Einstein? He was one of the greatest scientists of all time. He used his imagination to create and develop so many things. Our imagination is kind of like a tool for learning. Today we are going to use our imagination to create some really cool, unique monsters.

Agent Preparation

Purchase materials listed below and have supplies ready when participants arrive. Prepare LEGO bins for 4-H'ers to work in groups of two to three.

Materials/Resources

- LEGOs
- Googly eyes (various sizes)
- Pipe cleaners (various sizes)
- Computer/audio device with internet access
- Apples, pears, bananas, marshmallows or white icing, raisins or black icing, and pretzel sticks
- The book or audio *Where the Wild Things Are* by Maurice Sendak (ISBN 10: 0064431789)
- Drawing paper
- Markers or colored pencils

1. Introduction

- Assess prior knowledge of monsters by asking if monsters are real. Discuss what imaginary means (not real; make believe). Explain that, while some monsters are good and some are bad and scary, they are all created from someone using their imagination. Have young people think of good and bad monsters. (Examples of good monsters: Shrek; Sully from *Monsters, Inc.* Example of a bad monster: an alien)
- Promote physical activity by playing various monster-related interactive dance videos on YouTube while allowing young people to move and dance. Be sure to emphasize the importance of being creative with everything you do, including illustrating, dancing, etc. Example YouTube songs:
  Sid Shuffle (***https://www.youtube.com/watch?v=uMuJxd2Gpxo***) or Monster Mash

2. Exploration

Allow 4-H'ers to work independently or in groups using LEGOs, googly eyes, and pipe cleaners to create elaborate monsters. Encourage them to use reasoning skills and their imagination to create a story about their monster.

3. Sharing

Allow young people to share their creation and story with others. Ask what could possibly be added to their monsters to make them capable of doing other things.

Examples:

Wings to fly away

Bigger feet to stomp bad characters

More eyes to see at different angles

4. Generalizing

Use drawing paper and markers or colored pencils to implement any suggested changes.

5. Application

Read aloud *Where the Wild Things Are*, and ask participants if they sometimes feel misunderstood like Max did in the story. Explain that it is OK to feel this way and that it is a great idea to have pretend friends or a place in your house where you can be creative.

6. Assessment

Complete an evaluation for the lesson. (See page 24.)

7. Conclusion

Construct edible monsters using apples, pears, or bananas for the head, marshmallows or white icing for the eyes, raisins or black icing for the pupils, and pretzel sticks for ears, arms, and feet. Encourage participants to use their imaginations.

Lesson 3: Picture Puzzles (60 minutes)

Goal

Use LEGOs or DUPLOs® to promote reasoning, logic, and critical-thinking skills to find a solution to a puzzle.

Objective

Use LEGOs or DUPLOs to create a puzzle based on a picture the 4-H'er designed or brought from home.

4-H Cloverbud Measures

4-H'ers will gain self-confidence by participating in activities, asking and answering questions, and interacting with others.

4-H'ers will experience inclusive environments by participating in cooperative learning opportunities and engaging in the curriculum.

4-H'ers will experience opportunities for mastery/competence.

Next Generation Science Standards

K-2-ETS1-2: Developing and Using Models. Modeling in K-2 builds on prior experiences and progresses to include using and developing models that represent concrete events or design solutions. Students develop a simple model based on evidence to represent a proposed object or tool.

Mississippi CCR Standards for Science—Science and Engineering Practices

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Develop and use models.

Evaluate and communicate information.

Mississippi College and Career Readiness Standards

SL.K.1 SL.1.1: Participate in collaborative conversations about grade-appropriate topics and texts with both small and large, diverse groups of peers and adults.

PICTURE PUZZLES

What are puzzles? Games or problems solved by fitting pieces together in a logical way in the correct places.

Agent Preparation

Purchase materials listed below and have supplies ready when young people arrive. Prepare LEGO and DUPLO bins for young people to work independently.

Materials/Resources

- LEGOs (bricks)
- DUPLOs (bricks)
- Basic puzzles with large puzzle pieces
- Blindfold
- Book *What's Different?* by Fran Newman-D'Amico (ISBN-10:04864233344)
- Drawing paper (one sheet per participant)
- Markers or colored pencils (one box per participant)
- Scissors (one pair for every two participants)
- Two-sided tape or glue sticks
- Pictures (one per participant)
- Plastic bags (one per participant)
- Scrabble Cheez-It snacks

1. Introduction

Assess prior knowledge by asking young people questions. Do you like puzzles? Do you think puzzles are fun? What do you think you will learn by designing your own puzzle?

2. Exploration

Divide the children into teams of three to four. Have each team select a "puzzle maker." Blindfold the puzzle makers, and tell them they can touch or move the puzzle ONLY when their teammates say so. Puzzle makers can move only on command of their teammates. Tell the other team members that their job is to help the puzzle maker put the puzzle together. They must give very specific instructions so that the puzzle maker can put the pieces of the puzzle together. Nobody but the puzzle maker can touch the puzzle pieces. The team that puts the most pieces together wins!

Make a Puzzle!

Draw a picture or use one from home.

Fit LEGOs or DUPLOs onto the back of the picture and trace their outlines.

Cut on the traced lines.

Use glue or two-sided tape to attach the "puzzle pieces" (LEGOs or DUPLOs) to the picture pieces.

Place the "puzzle" in a plastic bag.

3. Sharing

Have participants form groups of two and solve one another's puzzles. 4-H'ers should share with their partner their thought process for solving the puzzle.

4. Generalizing

Ask young people what they learned from creating their own puzzle and solving their partners' puzzles.

Example questions:

Was it as easy as you thought it would be?

Do you think creating your own puzzle helped you solve your partner's puzzle faster?

Do you think scientists and engineers use skills like you just did to design and create real-world materials?

5. Application

Read aloud the book *What's Different?* by Fran Newman-D'Amico and have 4-H'ers apply their knowledge of solving puzzles to find solutions to the problems in the book.

6. Assessment

Complete an evaluation for the lesson. (See page 24.)

7. Conclusion

Have young people create words, their names, or phrases with Scrabble Cheez-It snacks.

Lesson 4: Tall Towers (60 minutes)

Goal

Use LEGOs to learn about architecture and construction of towers.

Objective

Construct the tallest LEGO tower possible in a given amount of time using team-building skills and science background knowledge.

4-H Cloverbud Measures

4-H'ers will gain self-confidence by participating in activities, asking and answering questions, and interacting with others.

4-H'ers will experience inclusive environments by participating in cooperative learning opportunities and engaging in the curriculum.

4-H'ers will experience opportunities for mastery/competence.

Next Generation Science Standards

K-2-ETS1-2: Developing and Using Models. Modeling in K-2 builds on prior experiences and progresses to include using and developing models that represent concrete events or design solutions. Students develop a simple model based on evidence to represent a proposed object or tool.

Mississippi CCR Standards for Science—Science and Engineering Practices

Ask questions and define problems.

Develop and use models.

Evaluate and communicate information.

Mississippi College and Career Readiness Standards

SL.K.5 SL.1.5: Add drawings or other visual displays to descriptions as desired to provide additional detail.

TALL TOWERS

What are towers? Tall, narrow buildings.

Agent Preparation

Purchase materials listed below and have supplies ready when young people arrive. Prepare LEGO bins so young people can work in groups.

Materials/Resources

- LEGOs (bricks)
- Drawing paper
- Markers or colored pencils
- Pictures of the five tallest towers in the world (Google search the towers listed in 4. Generalizing.)
- Book *The Tower* by Richard Paul Evans (ISBN-10: 0689834677)
- Measuring tape or rulers (one per group)
- Pretzel sticks, grapes, marshmallows

1. Introduction

Assess 4-H'ers' prior knowledge by asking questions.

Example questions and answers:

What are towers? Tall, narrow buildings.

Can you think of any towers in your town, state, or country? Church steeples, monuments, cellphone towers, fire towers, lighthouses, etc.

2. Exploration

Allow 4-H'ers to work in groups of two or three to use LEGOs to build the tallest tower they can in 25 minutes. Help young people measure their towers using a ruler or measuring tape.

3. Sharing

Have each group share how tall their tower is in inches. Then have participants give ideas on how to create a taller tower next time.

Example answer:

Start with a bigger base so the tower doesn't fall over.

Make sure the tower doesn't get too heavy while building it.

4. Generalizing

- Show pictures of the five tallest towers in the world.
  1) Burj Khalifa in Dubai, United Arab Emirates (2,717 feet tall)
  2) Shanghai Tower in Shanghai, China (2,073 feet tall)
  3) Abraj Al-Bait Clock Tower in Mecca, Saudi Arabia (1,971 feet tall)
  4) Ping An Finance Centre in Shenzhen, China (1,969 feet tall)
  5) Lotte World Tower in Seoul, South Korea (1,821 feet tall)
- Have young people draw a picture of how they could design a taller tower based on the knowledge learned during the group discussion.

5. Application

Read aloud *The Tower* by Richard Paul Evans.

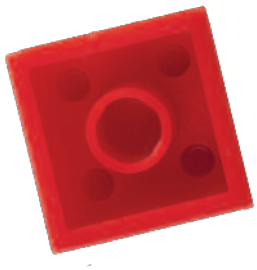
6. Assessment

Complete an evaluation for the lesson. (See page 24.)

7. Conclusion

Let participants create edible towers using pretzel sticks, marshmallows, and grapes. Other optional activities: let young people build a tall tower using cups, or let them draw one of their favorite towers.

Lesson 5: Building Bridges (60 minutes)



Goal

Use LEGOs to learn about architecture and construction of bridges.

Objective

Construct a bridge that will hold as much weight (pennies) as possible.

4-H Cloverbud Measures

4-H'ers will gain self-confidence by participating in activities, asking and answering questions, and interacting with others.

4-H'ers will experience inclusive environments by participating in cooperative learning opportunities and engaging in the curriculum.

4-H'ers will experience opportunities for mastery/competence.

Next Generation Science Standards

K-2-ETS1-2: Developing and Using Models. Modeling in K-2 builds on prior experiences and progresses to include using and developing models that represent concrete events or design solutions. Students develop a simple model based on evidence to represent a proposed object or tool.

Mississippi CCR Standards for Science—Science and Engineering Practices

Ask questions and define problems.

Develop and use models.

Evaluate and communicate information.

Mississippi College and Career Readiness Standards

SL.K.5 SL.1.5: Add drawings or other visual displays to descriptions as desired to provide additional detail.

SL.K.6: Speak audibly and express thoughts, feelings, and ideas clearly.

BUILDING BRIDGES

What are bridges? Structures that allow people and vehicles to cross over an open space.

Agent Preparation

Purchase materials and have supplies ready when young people arrive. Prepare LEGO bins so 4-H'ers can work in groups.

Materials/Resources

- LEGOs (bricks)
- Pictures of the world's most famous bridges (Google search for famous bridges.)
- Book *Pop's Bridges* by Eve Bunting (ISBN-10: 0152047733)
- Pennies (200–300 depending on the size of your club)
- Pretzel sticks, marshmallows, graham crackers, and chocolate spread or peanut butter
- Cups (36 cups per group)
- Drawing paper (one sheet per participant)
- Colored markers or colored pencils (one set per group)
- Certificates

1. Introduction

Assess prior knowledge by asking 4-H'ers questions.

Example questions:

What are bridges?

Why are bridges needed?

Can you think of any bridges in your community?

2. Exploration

Allow young people to work in groups of two to three to use LEGOs to build the sturdiest bridge they can in 25 minutes. Help young people judge which group has the strongest bridge by seeing which one can hold the most pennies without breaking.

3. Sharing

Have each group share how many pennies their bridge held before collapsing/falling/breaking.

4. Generalizing

Show the YouTube video "What Makes Bridges So Strong?" ***https://www.youtube.com/watch?v=oVOnRPefcno.*** Then show pictures of some of the most famous bridges in the world. (Example bridges: Brooklyn Bridge, Golden Gate Bridge).

5. Application

Read aloud *Pop's Bridges* by Eve Bunting. Discuss why the Golden Gate Bridge has the nickname "The Impossible Project" and why building strong bridges is so important.

6. Assessment

Complete an evaluation for the lesson. (See page 24.)

7. Conclusion

Let young people create edible bridges using pretzel sticks, marshmallows, graham crackers, and chocolate spread or peanut butter. An optional activity is to have 4-H'ers create bridges using straws and tape.

Lesson 6: Safe Ships (60 Minutes)

Goal

Use LEGOs to explore building and testing an object.

Objective

Construct a ship that can take two passengers (LEGO characters) across a body of water during a hurricane (simulation using a fan and pool of water).

4-H Cloverbud Measures

4-H'ers will gain self-confidence by participating in activities, asking and answering questions, and interacting with others.
4-H'ers will experience inclusive environments by participating in cooperative learning opportunities and engaging in the curriculum.
4-H'ers will experience opportunities for mastery/competence.
4-H'ers will demonstrate a capacity for science processing skills.

Next Generation Science Standards

K-2-ETS1-2: Developing and Using Models. Modeling in K-2 builds on prior experiences and progresses to include using and developing models that represent concrete events or design solutions. Students develop a simple model based on evidence to represent a proposed object or tool.

Mississippi CCR Standards for Science—Science and Engineering Practices

Ask questions and define problems.
Develop and use models.
Evaluate and communicate information.

Mississippi College and Career Readiness Standards

SL.K.6: Speak audibly and express thoughts, feelings, and ideas clearly.

SAFE SHIPS

What are ships? Large boats that can carry passengers or cargo/materials for long distances over water.

Agent Preparation

Purchase materials listed below and have supplies ready when young people arrive. Prepare LEGO bins so young people can work in groups.

Materials/Resources

- LEGOs (bricks and two characters per group)
- Small pool or rectangular bin of water
- Small fan
- *The Pop-up Book of Ships* by David Hawcock (ISBN-10: 0152047735)
- Internet access or YouTube video downloaded to your computer or a jump drive (See 4. Generalizing.)
- Cheerios, apples, cheese slices, bread sticks
- Certificates

1. Introduction

Assess prior knowledge by asking 4-H'ers questions.

Example questions and answers:

What is a ship? A large boat that can carry passengers or cargo/materials for long distances over water. Can you think of any large ships that carry people or cargo/materials? Cruise ships, navy ships; many factories and oil companies have ships.

*Some young people may say fishing boats. Explain that the main difference between a ship and a boat is size. (A ship can carry a boat, but a boat can't carry a ship.)

2. Exploration

Allow 4-H'ers to work in groups of two or three, using LEGOs and two characters, to construct a ship that can take two people across the ocean during a hurricane. Help young people test their ships using a fan and a small pool or rectangular bin filled with water. The ship must go from one end of the body of water to the other end without the passengers falling out. The groups that complete the task successfully will be awarded certificates.

3. Sharing

Have each group watch the other ships being tested, and allow participants to give feedback on ways to improve the ships.

4. Generalizing

Show the YouTube video "Ship/Cargo Ship/Transport for Kids" (***https://youtu.be/iiB-A0f6ZNQ***) and then allow 4-H'ers to redesign their ships either by reconstructing them or making a sketch.

5. Application

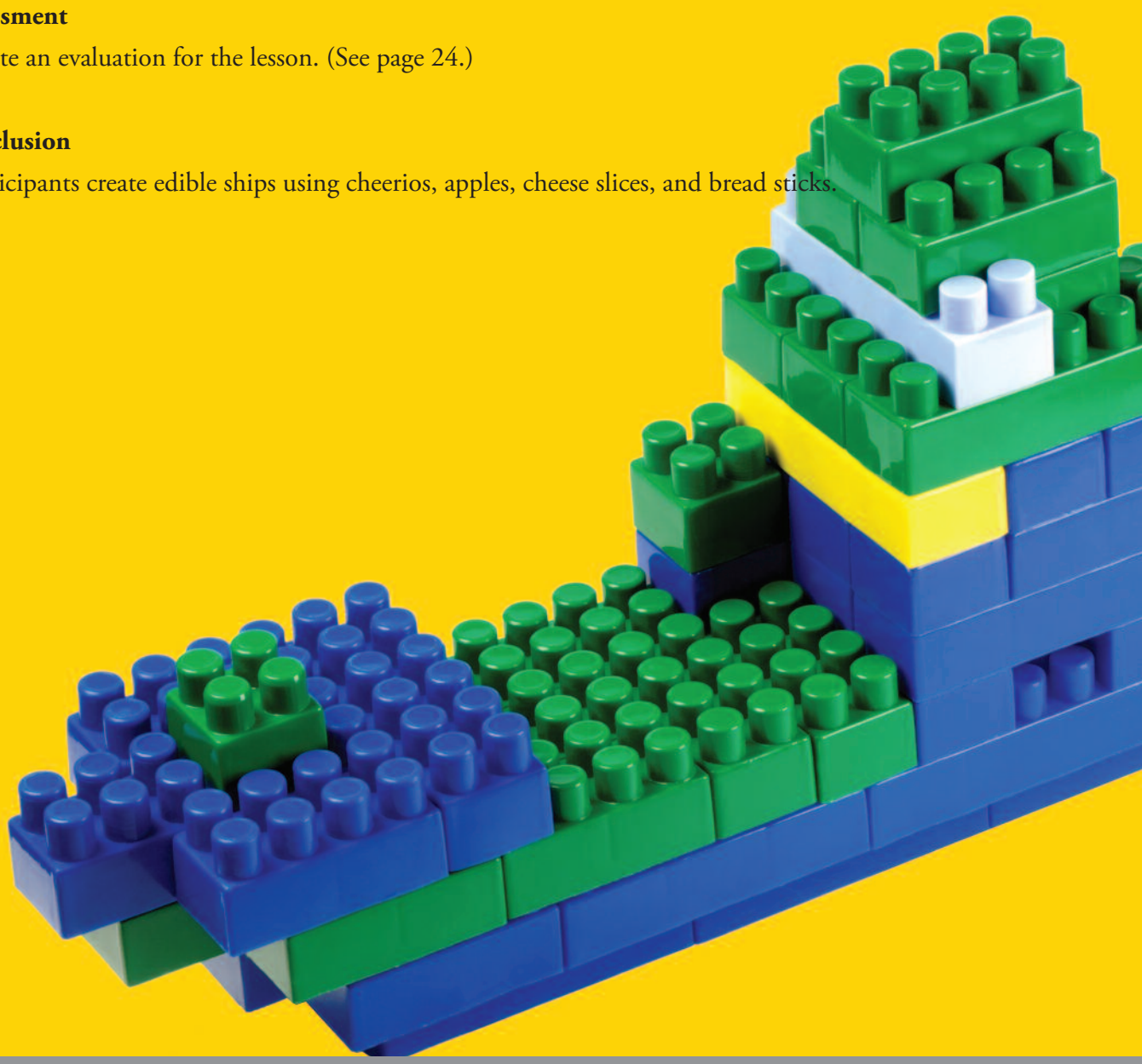
Read aloud *The Pop-up Book of Ships* by David Hawcock. Allow young people to discuss throughout the book what kind of cargo each ship might have been built to carry.

6. Assessment

Complete an evaluation for the lesson. (See page 24.)

7. Conclusion

Let participants create edible ships using cheerios, apples, cheese slices, and bread sticks.



Parent/Community Showcase

Goal: Young people will gain self-confidence and take ownership of what they have achieved.

Objective: Young people will share their final projects with others and have an opportunity to demonstrate and tell about their designs and creations.

Agent Information: After the young people have completed the LEGO curriculum, the agent will plan a time for participants to share with parents, siblings, and friends their activities, designs, and creations. The Parent/Community Showcase can be as simple as having the young people invite people after the last lesson, or the agent can have a special day planned for participants to showcase their work and reflect on what they have learned through the LEGO curriculum.

Ideas: Have young people choose one or two of the lessons to demonstrate, model, or share. Let them make invitations for the event. LEGO paper (found online) can be used for invitations or flyers. The young people could also vote on one or two of their favorite snacks to have for the event.

*The Mississippi State University Center for Community-Engaged Learning (CCEL) helped fund this LEGO curriculum. CCEL began its partnership with the MSU Extension Service in 2013. CCEL and MSU Extension are committed to the MSU tradition of instilling in young people the ideals of citizenship and service. Through your Parent/Community Showcase, we are working together to promote these ideals and build community engagement.

Evaluation

This is an observational instrument designed to measure the influence of the 4-H Cloverbud LEGO Engineering Club program on children who have actively participated in the program.

Please indicate today's date and select which lesson(s) was (were) delivered today. ____/____/____

☐ Lesson 1: Amazing Mazes ☐ Lesson 3: Picture Puzzles ☐ Lesson 5: Building Bridges
☐ Lesson 2: Monster Mash ☐ Lesson 4: Tall Towers ☐ Lesson 6: Safe Ships

Instructions: For each item, use an X to indicate a response that represents the number of children who exhibit/experience the listed behavior/setting as a result of their involvement with the 4-H Cloverbud Program.

1. Because of participation in the 4-H Cloverbud LEGO Engineering Club program, I observed that the 4-H Cloverbud children:

	None of the children	Some of the children	Half of the children	Most of the children	All of the children
Gained self-confidence or self-esteem. Children displayed confidence and positive self-esteem as observed in their ability to participate in the 4-H Cloverbud activities, ask/answer questions, and interact with others.					
Improved their physical skills. Children exhibited fine (writing, cutting, drawing, etc.) and gross (jumping, arm and leg movement, body coordination, etc.) motor skills.					
Gained subject-matter knowledge. Children expressed verbal and nonverbal knowledge related to the subject-matter content of their 4-H Cloverbud activity involvement.					
Improved ability to get along with others. Children were able to share, communicate, and make friends with peers in the 4-H Cloverbud group.					

	None of the children	Some of the children	Half of the children	Most of the children	All of the children
Increased decision-making skills. Children were able to make decisions in regard to activity input and interaction with peers and adult leaders.					
Experienced positive relationships with caring adults. Children learned and developed in an adult-leader-directed environment; the learning environment was positive, caring, supportive, and fun.					
Experienced inclusive environments. Cooperative-learning techniques encouraged children to work on activities together; engaged the children in activities that were noncompetitive without setting up categories or classes; valued and respected the diversity of all participants.					
Experienced opportunities for mastery/competence. Children were allowed to be creative across eight different subject areas; used the experiential learning cycle through the activities as children experienced, shared, processed, and generalized; curriculum and activities met the needs of the children.					
Experienced opportunities to value and practice service to others. Children learned to appreciate community service through 4-H Cloverbud activities; cleaned up after activities and helped each other; shared materials and respected fellow 4-H Cloverbud members.					
Experienced an emotionally and physically safe environment. Children's needs were met on their emotional, physical, social, and cognitive level; low-risk, safe activities ensured the safety of 4-H Cloverbud children; ratio of children to adults was low (about 6 to 1).					

	None of the children	Some of the children	Half of the children	Most of the children	All of the children
Experienced opportunities for self-determination. Children gained confidence through success-oriented activities; noncompetitive activities fostered intrinsic motivation; activities focused on the process of doing activities, rather than the product.					
Experienced opportunities for engagement in learning. Children had fun, positive experiences; children had access to numerous subject areas that interested them; leaders were nurturing, enthusiastic, and sensitive role models.					
Experienced opportunities to see oneself as an active participant in the future. Children were given choices in upcoming activities; explored a variety of future career options; discussed and role-played the reality that what one does today often determines what happens tomorrow.					
Experienced opportunities for leadership and independence. Children gained skills and confidence for leadership and self-discipline; learned responsibility for decisions made and actions taken; led simple tasks.					
Increased interest and engagement in STEM (Science, Technology, Engineering, and Math). Children expressed interest in science and were engaged by the science-based lessons and activities.					
Improved attitudes toward STEM. Children expressed positive attitudes and aspirations toward science.					

	None of the children	Some of the children	Half of the children	Most of the children	All of the children
Developed STEM skills and abilities. Children developed skills such as listening, observing, searching, asking questions, and gathering information.					
a. Asked questions about a problem					
b. Defined a problem					
c. Developed a simple model					
d. Used a simple model					
e. Constructed explanations					
f. Designed solutions					
g. Evaluated information					
h. Communicated information					
i. Answered questions about a problem					
j. Spoke audibly					
k. Expressed thoughts, feelings, and ideas clearly					
l. Used a combination of drawing, dictating, and writing to communicate about a topic					
m. Added drawings or other visual displays to descriptions to provide additional detail					
n. Participated in collaborative conversations with peers and adults					

Adapted from Scott D. Scheer, PhD, State 4-H Extension Specialist, The Ohio State University.

2. Number of children represented in this evaluation _____

3. Number of girls _____ and boys _____

4. How was this program delivered?

_____ 4-H club

_____ 4-H camp

_____ After-school program

_____ In-school program

5. Number of meetings this evaluation represents _____

6. Number of weeks over which this evaluation occurred _____

7. Person completing this evaluation _____

8. Which county does this evaluation represent? _____

9. What is your role?

_____ 4-H Cloverbud volunteer leader

_____ 4-H Cloverbud parent

_____ Youth worker

_____ Teacher

_____ Extension agent

_____ Other: _____

10. How long (e.g., months, years) have you served as a 4-H Cloverbud volunteer leader?

_____

Thank you!

Please return this completed form to your 4-H Cloverbud leader or your Extension agent.

Photo Release

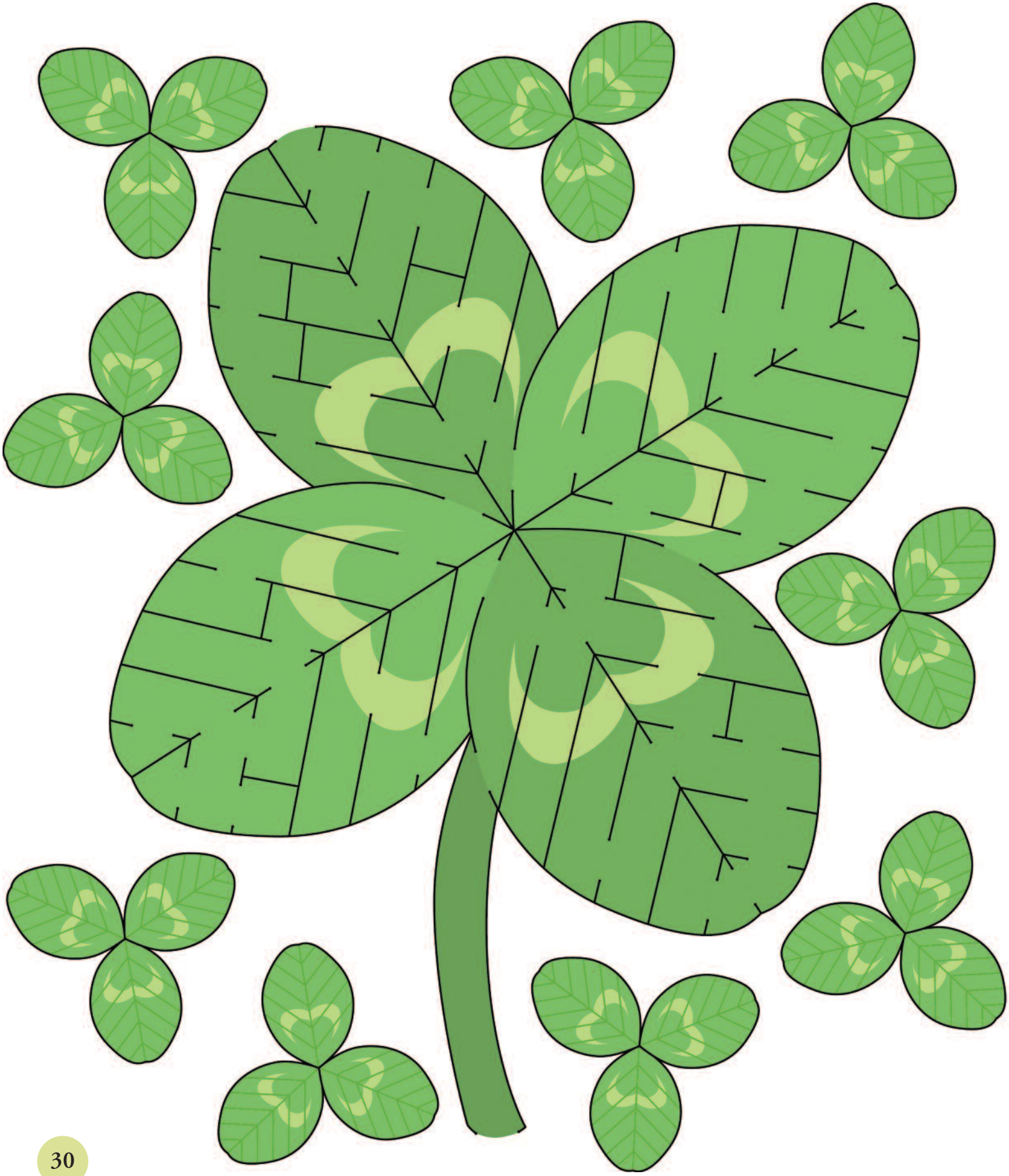
Subject name _____ Date _____

I permit the Mississippi State University Extension Service to photograph my child and/or me and use those photographs for educational and publicity purposes. I release Mississippi State University and the Mississippi State University Extension Service from any claims that might arise from use of these photographs.

Signature of subject (if 18 or older) _____ Parent/guardian (if subject is younger than 18)* _____

*If subject is under 18, a parent or guardian must write the child's name as the subject and grant permission by signing on the appropriate line.

Clover Maze Activity



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