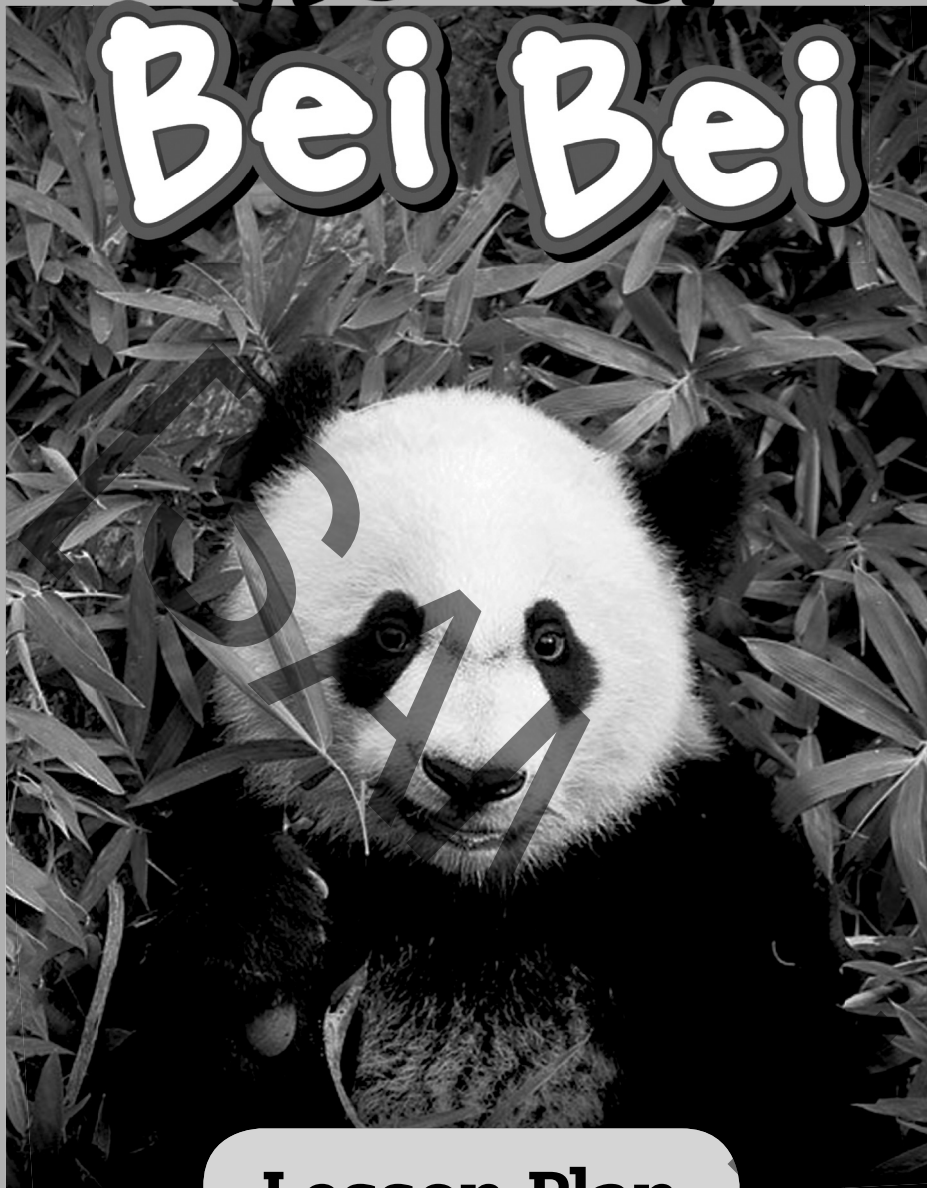


A Den for Bei Bei



Unit 1
Animals

Lesson Plan

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Smithsonian

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Answer Key: A Den for Bei Bei

page 10—What Does Bei Bei Do?

1. climbs
2. lays
3. walks
4. plays

page 11—A Day in the Life of Bei Bei

Students' drawings will vary but should show events that the panda would do during the day. Students should draw the events from the book.

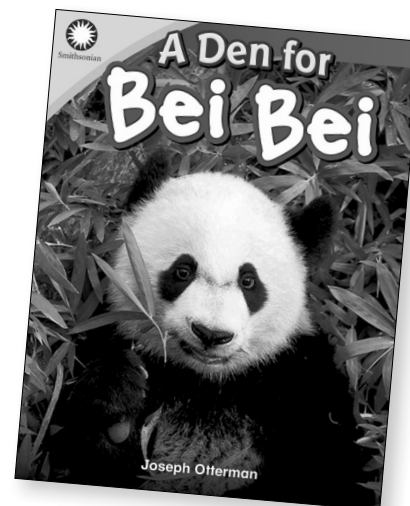
page 17—A Den for Bei Bei Quiz

1. A
2. C
3. Students should draw or write about the cameras zookeepers use to watch the panda.

A Den for Bei Bei

Materials

- ▶ *A Den for Bei Bei* books
- ▶ copies of student activity sheets (pages 9–19)
- ▶ tri-folded sheets of paper
- ▶ **STEAM Challenge materials include but are not limited to the following:**
 - ✓ cardboard
 - ✓ construction paper
 - ✓ craft sticks
 - ✓ fabric strips
 - ✓ felt
 - ✓ paper bowls/cups
 - ✓ rubber bands
 - ✓ sticks
 - ✓ straws
 - ✓ string
 - ✓ stuffed animal
 - ✓ yarn



Learning Objective

- ▶ **Reading:** With prompting and support, describe the relationship between illustrations and the text in which they appear.
- ▶ **Writing:** Use a combination of drawings, dictating, and writing to narrate a single event or several loosely linked events, tell about the events in the order in which they occurred, and provide a reaction to what happened.
- ▶ **Speaking and Listening:** Participate in collaborative conversations with diverse partners about grade appropriate topics and texts with peers and adults in small and larger groups.
- ▶ **Engineering:** Define an engineering problem, design and evaluate solutions, and optimize a design based on test results.

Phenomena

Animals interact with objects in their habitats in many different ways.

Lesson Timeline

Day 1	Day 2	Day 3	Day 4	Days 5–10
Introductory and Before Reading Activities (page 4)	During Reading Activities (page 5)		After Reading Activities (page 5)	STEAM Challenge and Assessments (pages 6–8)
Define the STEAM Challenge and identify the relationship between the photographs and the text.	Research giant pandas in a zoo, examine the relationship between the images and the text, and brainstorm design solutions.		Describe the sequence of events in an imaginary day in the life of Bei Bei.	Design, build, test, improve, reflect on, and share hammocks. Complete the assessments.

A Den for Bei Bei (cont.)

STEAM Vocabulary

den hammock mural

Introductory Activity

Define the Problem

1. Display the cover of *A Den for Bei Bei*. Have students describe the image on the cover of the book. Encourage students to share any background knowledge they have about pandas.
2. Reveal the STEAM Challenge by reading aloud to students pages 18–19 of the book.
 - ▶ Display the Interactiv-eBook for a more digitally enhanced introduction to the challenge.
3. Distribute *Make a Plan* (page 9) to students. Read the STEAM Challenge summary aloud to students. Have each student complete the summary by tracing the words and filling in the blank.

Note: You may wish to distribute all student activity sheets as one packet. They will be used throughout the STEAM Challenge.

Before Reading

1. Write the vocabulary words on the board, and define each word. Show students images from the book or the internet to support their understanding of the words.
2. Distribute sheets of paper folded into thirds to students. Have each student write one word in each section and draw a picture to correspond to the word. Support students as needed by writing the words for them or by writing the words with a highlighter and having students trace the letters.
3. Tell students that books are carefully crafted to give information. Information can be found in the words or the images, and both the words and images work together to present the information.
 - ▶ Explain that as students read *A Den for Bei Bei*, they will look for ways the words and images help the reader understand more about Bei Bei.

A Den for Bei Bei (cont.)

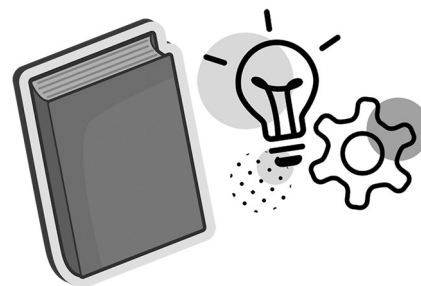
During Reading

Research and Brainstorm

1. Distribute the *A Den for Bei Bei* books to students. Allow students time to preview the books and look at the images on each page. Prior to reading the book, have students describe the images.
 - ▶ Read the book aloud to students as they follow along in their own books.
 - ▶ Display the Interactiv-eBook for a more digitally enhanced reading experience. You may wish to have students annotate the PDFs as you read.
 - ▶ Play the audio recording as students follow along to serve as a model of fluent reading. This may be done in small groups or at a listening station. The recording will help **English language learners** practice fluency and aid in comprehension.
2. Distribute *What Does Bei Bei Do?* (page 10) to students. Explain that the images and words work together to tell about Bei Bei.
 - ▶ Have students review the word on each page and the corresponding image. Ask students to identify what they learn about Bei Bei from the images.
 - ▶ Read the words at the top of the activity sheet with students, and guide them to find the corresponding images in the book. Have students work individually, in pairs, or as a whole group.
3. Lead students with guiding thoughts and questions as they discuss the STEAM Challenge: *Why do giant pandas like hammocks? What pages in the book help us know how pandas use hammocks?*
4. Then, have students independently record ideas on their *Make a Plan* activity sheets.

After Reading

1. Review the vocabulary words and their definitions with the whole group. Work with students to create their own movements or gestures to represent each word. Give students 30 seconds to create each representation. Then, have students practice saying the words while doing their movements.
2. Review with students all the things that Bei Bei does in the book. Make a list on the board.
3. Distribute *A Day in the Life of Bei Bei* (page 11) to students. Have each student make a realistic sequence of events to show what Bei Bei would do during the day. Encourage students to select activities from the book to include in their events and record them in the correct order. Determine if you want students to write, draw, or do a combination of the two for each event they include.
4. Encourage students to share their events with small groups or the whole class.



A Den for Bei Bei (cont.)

Prep

- ▶ Prepare all materials for the STEAM Challenge.
- ▶ You may choose to invite volunteers to help monitor and facilitate group work if you are doing the STEAM Challenge with multiple groups at once.
- ▶ Review all designs prior to building.

STEAM Challenge

Design and Build

1. Discuss the following questions to guide student thinking with the STEAM Challenge:
 - ▶ *How is Bei Bei's hammock held off the ground?* Reread pages 4–5 of the book. Have students identify the pipe frame that holds the woven hammock off the ground.
 - ▶ *What are other ways to hold a hammock off the ground?* Draw on students' experiences, or guide them to understand that hammocks can be tied between trees or other objects.
2. Distribute previously completed activity sheets. Review the STEAM Challenge on pages 18–19 together. Create an anchor chart of names and drawings of the materials for students to refer to when recording their designs. Encourage students to preview all the materials available.
 - ▶ Show students the stuffed animal that the hammock must hold. Encourage students to hold the stuffed animal so they can look at its shape and understand how heavy it is. Tell students that the animal must stay in the hammock for at least two minutes.
 - ▶ Ask students to consider the materials they will use.
 - ▶ Remind students that their hammocks must not touch the ground and that they will have to incorporate that into their designs. Determine and share with students a location from which the hammocks can be hung.
3. Have students independently sketch and label their designs on their *Make a Plan* activity sheets.
4. Organize students into teams of two or more. Distribute one copy of *Team Plans* (page 12) to each team. Ask teams to have members share their plans. Then, have each team choose, sketch, and label a team plan.
 - ▶ **Challenge** students by adding goals (e.g., the hammock must hold a heavier object, the hammock must use specific materials, or the hammock must be strung over a larger gap).
5. Explain to students that when they build their models, they must follow their design plans. Reassure them they will have an opportunity to change and improve their design plans after they present them. Review classroom expectations for working with materials. Then, give teams time to gather materials and build their hammocks.
 - ▶ Digitally record students' processes to share at a later date with students and parents.
6. Distribute *Think about It* (page 13) to students. Explain that reflection is an important part of the engineering design process. Read aloud numbers 1 and 2 on the activity sheet, and have students mark their responses. Ask volunteers to share.

A Den for Bei Bei_(cont.)

Prep

- Prepare all materials for the STEAM Challenge.
- Review all designs before teams begin improvements.

STEAM Challenge

Test and Improve

1. As a group, discuss the following questions to guide student thinking with the STEAM Challenge:
 - *What design did Bei Bei's hammock have?* Reread pages 4–5 of the book. Guide students to understand that the hammock in the photograph has a woven design. If students are not familiar with the process of weaving, model how to weave two pieces of paper by taking one strip of paper and going under and over another strip of paper.
 - *What materials and design would be useful for holding heavy objects?* Encourage students to preview the materials available and discuss as a group which ones would be best for weaving. Ask students to consider: *How can weaving be used in a hammock design?* Encourage students to consider weaving as they improve their designs after the initial testing.
2. Gather teams for testing. Explain that teams will offer feedback after the test. Use *Friendly Feedback* (page 14) to review best practices for giving feedback.
3. Distribute *Hammock Test Results* (page 15) to students, and ask them to record results for each team.
4. Have teams test their hammocks one at a time. Allow time for students to set up hammocks when the designs do not incorporate frames. Place the stuffed animal in each hammock. Set the timer for two minutes.
5. Provide time for teams to brainstorm ways to improve their designs based on test results and feedback. Refer students back to their *Team Plans* activity sheets. Ask them to sketch their improved design plans and explain any changes.
 - **Challenge** successful teams with additional goals for the second design (e.g., the hammock must hold a heavier object, the hammock must use specific materials, or the hammock must be strung over a larger gap).
6. Have teams gather materials to improve their designs. Then, have them make improvements and retest their hammocks. **Note:** If students will be observing, recording, and offering feedback for the retest, provide extra *Hammock Test Results* sheets for students.
7. Have students complete numbers 3 and 4 on their *Think about It* activity sheets.

A Den for Bei Bei_(cont.)

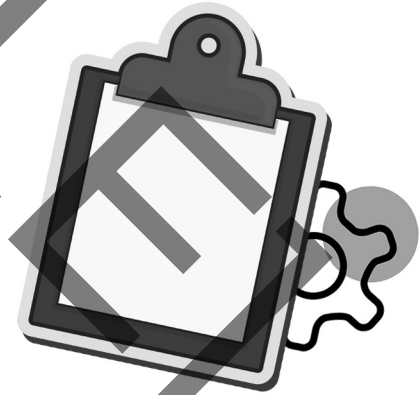
STEAM Challenge

Reflect and Share

1. Gather students together to reflect and share about the STEAM Challenge. Guide the discussion by asking students to share their responses to numbers 1–4 on their *Think about It* activity sheets.
2. Ask students to reflect on other groups' projects by asking some guiding questions. *What did they learn from other groups that they used in their second attempt at their hammocks? What would they change if they had a chance to improve their hammocks again? Would they improve their hammocks or start all over with new designs? Do they think their hammocks would be comfortable?*
3. Have students complete numbers 5 and 6 on their *Think about It* activity sheets.
4. Distribute *Engineering Design Process* (page 16) to students, and review how they used each step to complete the challenge. Use the statements on *Engineering Design Process Reflection* (page 19) to help students think about the steps.
 - ▶ Have students annotate the infographic with words or pictures specific to this challenge.
 - ▶ Ask students to circle their favorite parts.
5. Discuss with students the kinds of jobs scientists do that help animals. Encourage students to share their knowledge or previous experiences with these jobs.

Assessment Activities

1. Have students complete a short posttest, *A Den for Bei Bei Quiz* (page 17), to assess this lesson's reading objective. Read the questions on the posttest aloud for students.
 - ▶ Students may use the Interactiv-eBook activities in the Digital Resources for assessment purposes (optional).
2. Guide students to complete *Teamwork Rubric* (page 18) to reflect on and evaluate their work and collaboration skills.
3. Have students verbally answer the Think and Do questions from the book.



Do you want to learn about panda bears?

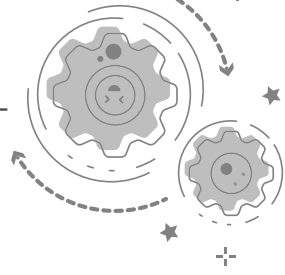
"Biology and travel are important to studying giant pandas. The native habitat of giant pandas is in the mountains of central China. Studying biology, or all about living things, and traveling to places such as China, will help you learn the most about these black and white animals."

— Dr. Brandie Smith, Associate Director of Animal Care, National Zoo

Read this career advice aloud to students. Read the author's name and job title. Discuss the advice, and encourage students to think about what they could do at school and at home to prepare for this type of career.

Name: _____

Date: _____



Make a Plan

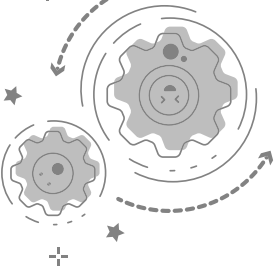
Directions: Write the challenge. Brainstorm ideas.
Sketch a plan.

Challenge: Design and build a **hammock** that

can hold a _____.

My Thoughts

My Plan



Name: _____

Date: _____

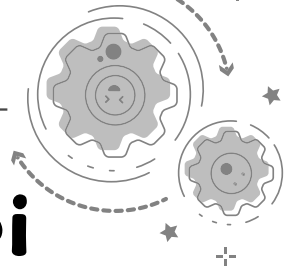
What Does Bei Bei Do?

Directions: What does Bei Bei do? Draw pictures and write the words.

<p>1. pages 2–3 trees</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>3. pages 8–9 grass</p> <p>_____</p> <p>_____</p> <p>_____</p>
<p>2. pages 4–5 hammock</p> <p>_____</p> <p>_____</p> <p>_____</p>	<p>4. pages 12–13 snow</p> <p>_____</p> <p>_____</p> <p>_____</p>

Name: _____

Date: _____

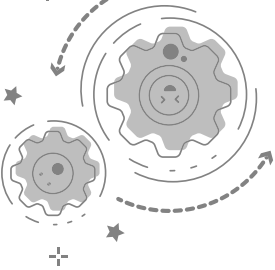


A Day in the Life of Bei Bei

Directions: Draw or write about Bei Bei's day.

Four rectangular boxes with dashed borders for drawing or writing. Each box is accompanied by three horizontal lines (solid top and bottom, dashed middle) for writing.

Sample



Team Members: _____

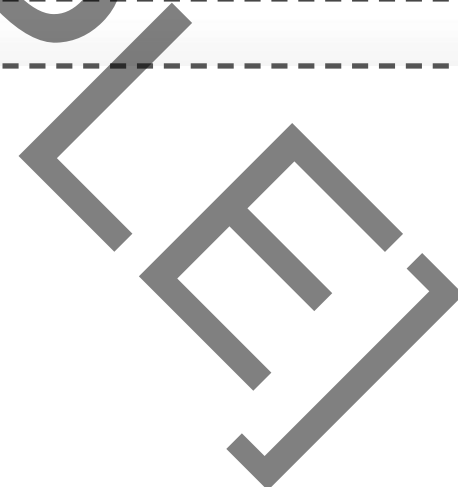
Team Plans

Directions: Sketch **Plan 1**. Sketch **Plan 2**.

Plan 1

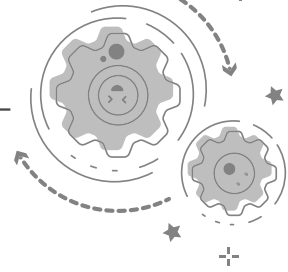
SAMPLE

Plan 2



Name: _____

Date: _____



Think about It

Directions: Check *yes* or *no*. Circle the words. Fill in the blanks.

1. My team listened to each other. ☐ yes ☐ no

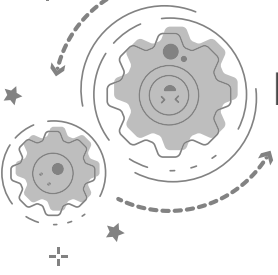
2. I added my ideas to the design. ☐ yes ☐ no

3. Our first plan (worked/did not work) because

4. Our second plan was (better/worse).

5. I learned

6. It was hard when



Name: _____

Date: _____

Friendly Feedback

Directions: Ask questions. Give ideas. Use these sentences to get started.

Clarify

How did you _____
_____?

Warm Feedback

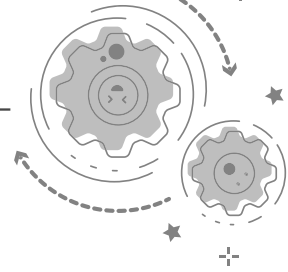
I like _____ because _____.

Cool Feedback

You might want to try _____
_____.

Name: _____

Date: _____



Hammock Test Results

Directions: Mark the chart for the hammock test. Circle *yes* or *no*.

Team	Did both ends of the hammock hang?		Did the hammock hold the stuffed animal?	
1	yes	no	yes	no
2	yes	no	yes	no
3	yes	no	yes	no
4	yes	no	yes	no

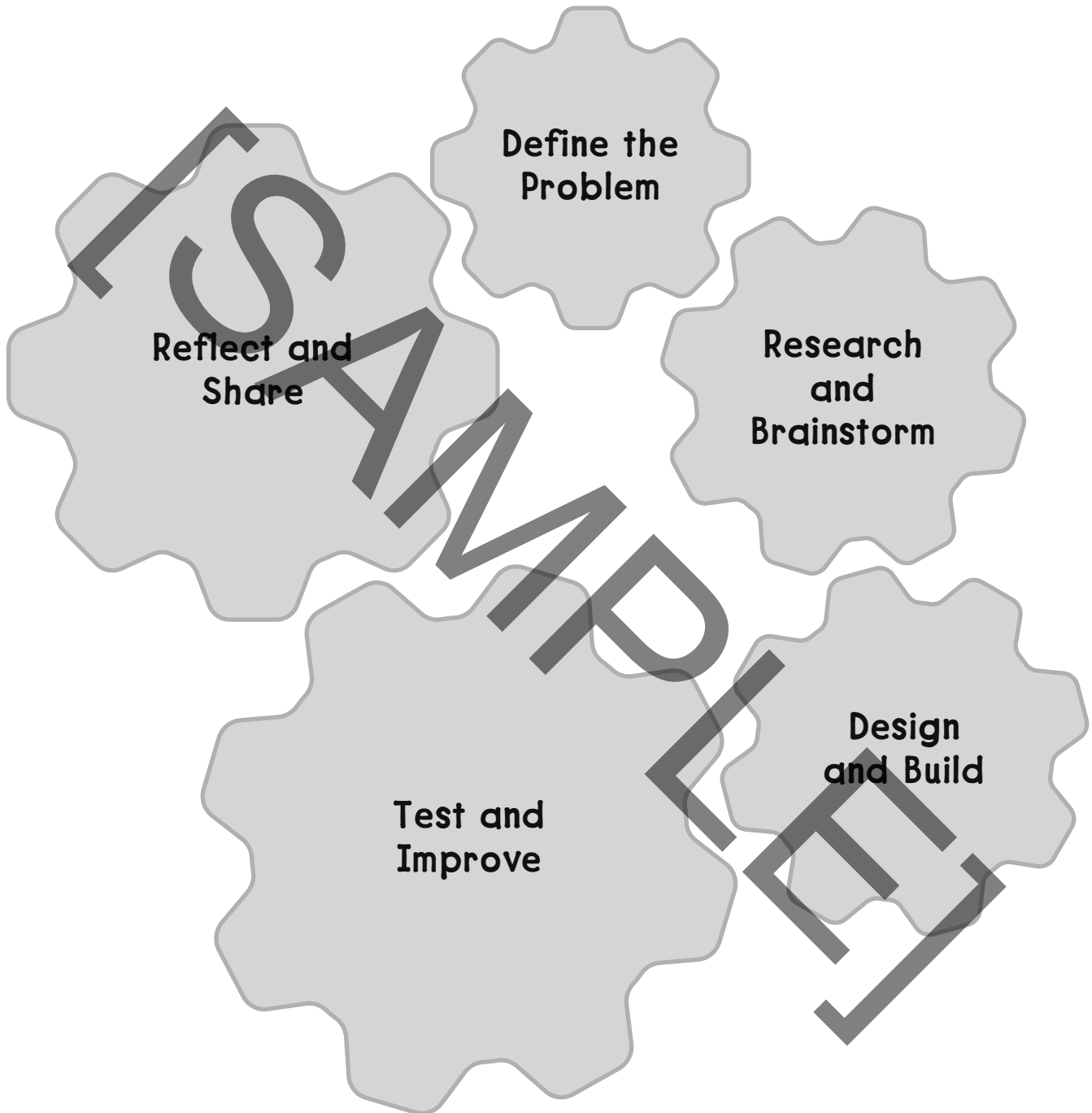
Draw the hammock that was the best.



Name: _____

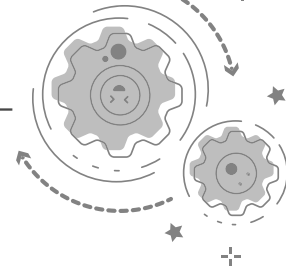
Date: _____

Engineering Design Process



Name: _____

Date: _____



A Den for Bei Bei Quiz

Directions: Listen to your teacher. Answer the questions. Show what you know.

1. Where does Bei Bei climb?

☐ (A) trees



☐ (B) ball



☐ (C) mural



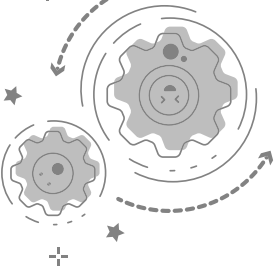
2. What does Bei Bei do on the grass?

☐ (A) play

☐ (B) sleep

☐ (C) walk

3. How do zookeepers watch Bei Bei?



Name: _____

Date: _____

Teamwork Rubric

Directions: Think about your team. Circle the faces to show what you did. Write about how you helped.











= Always



= Often



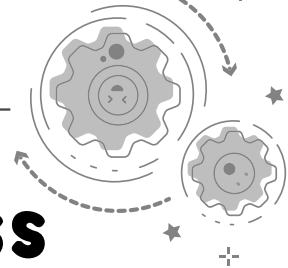
= Sometimes

 I listened to people on my team.			
 I helped people on my team.			
 I shared ideas with people on my team.			
 We made choices as a team.			

I helped my team when I _____

Name: _____

Date: _____



Engineering Design Process Reflection

Directions: Read the list. Check the boxes to show what you did.

Define the Problem

- ☐ I understood the problem or task.

Research and Brainstorm

- ☐ I researched and brainstormed ideas.

Design and Build

- ☐ I designed and built models.

Test and Improve

- ☐ I tested and improved models.

Reflect and Share

- ☐ I reflected on and shared my work.



STEAM CHALLENGE



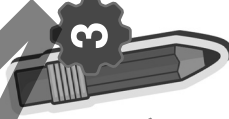
1 Research and Brainstorm

Learn about Bei Bei.



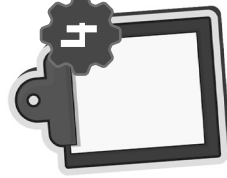
2 Design and Build

Draw your plan. Build your hammock!



3 Test and Improve

Put a stuffed animal in the hammock. Then, try to make it better.



4 Reflect and Share

What did you learn?

The Problem

Bei Bei needs a hammock! Can you build him one?

The Goals

- Your hammock should fit a stuffed animal.
- It needs to hang off of the ground.
- It should hold for at least two minutes.

