Concept/Topic: Canoe	Week 2

Essential Question: 2	How is teamwork an important part of building and maneuvering a canoe?		
Guiding Questions: B, C	How is teamwork used to build a canoe? What makes a canoe float?		
Social Studies Learning Outcomes:	Students will become familiar with: • canoe traditions around canoe building and maneuvering • traditional values and ancestral teachings		
Literacy Development Learning Outcomes:	Students will be able to: • write procedural texts • maintain a science journal • identify sentence structures	**Reading Skills:** reading for information reading directions and procedures	
EALR(s):	**Reading:** 2.2, 3.1, 3.2, 1.1, 1.2	**Writing:** 1.1, 2.2, 2.3	
	Communication:	**Social Studies:**	**Other:** Science 1.1, 2.1
Vocabulary/ Language Development (words, phrases):	adze, ancestors, anger, arm span, buoyancy, canoe, carve, carver, cedar tree, ceremony, etiquette, float, paddle, plug, sink, teamwork, tools, water.		
Resources:	• An on-going experiment and observation station with different kinds of wood. Place questions at the station such as: "Does all wood float? Why or why not?" • Video*: Hank Gobin Interview* –Tulalip Tribe. • "Tulalip Tribes: From Our Ancestors" –Hank Gobin (see C3.6-11). • "What Makes a Canoe Float?" from *Canoes on Puget Sound* –Nan McNutt (see C2.3-14). • Canoe Carvers section in "Native American Canoes in Washington" (see CI.5).		
Suggested Books:	• *Canoes* – Zamai Zahir. • *Cedar* –Hilary Stewart. • *Coast Salish Canoes* –Leslie Lincoln. • *The Building of a Canoe* –Tulalip Tribes.	• *Life Cycle of a Canoe* –Romaine Culpepper. • *How Big Will My Canoe Be?* –Nan McNutt	
Culminating Activity	Students learn from elder the proper use and care for all the canoe tools and the need for team spirit.		

Monday	Tuesday	Wednesday	Thursday	Friday
Morning Circle				
• Post question in large letters, "What makes a canoe float? • Review what was learned last week about canoes and uses. Tell that this week we will learn about how people work together to build and maneuver a canoe. • Discuss team behaviors. Ask "What makes a team successful?"	• Share and discuss homework. • Review Monday's work. • Discuss and record findings and questions that remain about buoyancy.	• Show and identify pictures of old and modern tools. • Have students make labels of the tools for display area.	• Recall life cycle lesson (from Hunting and Gathering). • Have student listen for traditions and teamwork • Have students sort and arrange pictures to match story.	• Have samples of procedural text. (see C2.18). • Say, "We've learned a lot about how canoes are made. Let's look at a book telling how things are made." • Ask, "How are these books organized?"
Shared Reading				
• Focus on teamwork. • Have each team choose a team name to use all week. • Do Nan McNutt's "Feel The Force" (see C2.3) and "Lighten The Load" (see C2.4) activities. (These activities can be done in stations).	• Ask class: "What is soap made of? Do you think it will float?" • Do experiment Floating a soap **l'ai**, (see C2.6). • Have whole group do guided writing about experiment, observations, and outcomes.	• Read *Life Cycle of a Canoe.* • Complete a chart using vocabulary to include Canoe Week 1. Tools Old time | Modern	• Read big book *How Big Will My Canoe Be?* • Discuss—note p. 10—River Canoe. • Do procedural text activity (see C2.17).	• Read one example of procedural text to students. • Have the whole group do guided writing: How to make a peanut butter sandwich or hamburger. • Stress the structure of a procedural text.
Individual, Paired, or Small Group Work				
• Have students write science journal entries based on predictions and outcomes from "Feel The Force". Use prompts such as, "When I pushed on the balloon, I noticed…", "When the jug was in the water, I noticed…" (see C2.13-14).	• Have individual students write (or label or draw) in science journals "What I observed…" • Stress using scientific vocabulary. • Have students read work to a buddy.	• Have students cut and arrange sentence strips to make their own book *Life Cycle of a Canoe* (see C2.16). • Have students illustrate their work and read to the class.	• Together create one large canoe on paper. Use teacher's arm span. • Highlight tool names in story. • Some students could make plugs. • Display canoe. • Link to math; cut string to arm span. • Measure things in room.	• After discussing text as a group, divide students into pairs or threes. Use form to create procedural story *How to Make a Canoe.* (See C2.15.)
Teacher Instruction				
• Make science journals to observe and record (see C2.13-14). • Find tub for water. • Find elder or carver for culminating activity. • Have vocabulary cards made. • Find *Life Cycle of a Canoe*, page 7. • Assign homework (see C2.5).	• Have various objects available for observation—Ask, "Does it sink or float?" • Bring in samples of cedar wood. • Invite parents to help on Thursday to render canoe shape.	• Post pictures in room.	• Cut large paper for rendering of canoe. • String. • Get clay for plugs—see photo of traditional plugs. • Homework—take home own copy of Life Cycle…read to family. • Use paper dolls for students to create own, smaller canoe. (See C2.21-22.)	• Make multiple copies of *How Big Will My Canoe Be?* and *Life Cycle of a Canoe*, to be used for buddy reading choices.

Canoes on Puget Sound

By Nan McNutt

What Makes a Canoe Float?

Hull shapes, different uses, ratios of width, length and depth, are just some of the observations we want our students to notice about the canoes used on Puget Sound. But, first we need to address the basic understanding of "why canoes float". Our task is to introduce the concept of buoyancy - the upward force exerted upon an immersed or floating object. To guide us we turned to *The Everyday Science Sourcebook: Ideas for Teaching in the Elementary and Middle School,* by Lawrence F. Lowery. This is a great book and you will want to run down to your local bookstore and purchase a copy!

Activity #1: The Feeling of Force

You need: block of wood
blown up balloon
empty plastic bottle with a tightly fitting lid
empty can

We set up an exploration area with tubs of water, which include sponges and dish towels, where teams of students can do experiments.

1. Each student on the team takes turns holding different objects under the water to feel the water pushing up against them. The focus is on the feeling of the **force .**

2. Once all the students feel the force, we discuss the feeling of water pressing up against and around the object, and their hands.

3. The students record their experience of this feeling with drawings and labels.

4. Finally, we name the feeling or force, buoyancy, and write their definitions of buoyancy on the board:

> Buoyancy is the upward force pressing upon an object.

Activity #2 A: Lighten the Load

You need: gallon plastic jug with fitted lid
yard-long cord
10-gallon plastic tub/ bucket

We continue with another experiment to further explore how buoyancy, the upward force, makes heavier objects seem lighter.

1. We fill the 10-gallon plastic tub/ bucket with water not all the way to the top.

2. Tying a long cord around the gallon plastic jug, we make a loop so that several students can pick up the load.

   It does take several students to lift the jug. They tell the other students just how heavy it feels, and then gently lower the jug into the tub of water. "It's light! Oh, my gosh," Julianna exclaims, "I can't believe it!"

3. Of course, everyone wants to try the experiment, and as every group finishes their turn, they return to their tables to record (writing and drawing) the second experiment in their journals.

4. I record their generalizations on the board.

> Buoyancy makes objects lighter when put in water.

Activity #2 B: What happens to the water?

You need: gallon plastic jug with fitted lid and ropes
10-gallon plastic tub/ bucket
erasable marker

Did you notice what happened to the water when you put the large gallon jug into the 10-gallon bucket? Ask your students for predictions before you repeat activity #2 A. Only this time pay attention to the water.

1. Before placing the gallon jug into the water, mark the level of the water.

2. After the jug is in the water, mark the level of the water.

3. Discuss, record and illustrate what has happened to the level of the water. The difference in the level is the amount of space that the jug occupies in the water.

> This space that an object occupies is called volume of water.

Activity #3 A. Homework Assignment

Your students need: Buoyancy Testing Instructions and Sheet
10 items from your house
sink and towel

As a fun home assignment ask the students to test out 10 objects that the select from their home. Remind them that it is a test so that they have to use the Buoyancy Testing Instructions and Sheet and they should write their prediction down before testing the object. Also remind them that their parents will be most pleased if they do this in a sink and clean up after themselves when the test is completed.

Using the students' homework as an evaluation tool, we are able to easily discern whether the students saw some discrepancies between their predictions and the actual tests. Most students are able to articulate this discrepancy. Barbie writes, about the plate that floats, "because the length was the same—it was lighter." While Barbie did not predict that the plate would float, she was able to comprehend after the test that the upward force on the flat heavy plate, forced it to float: "it was lighter".

Crystal used a fork made of heavy plastic. She predicted that the fork would float, but it sank. Crystal gives no explanation for why the fork behaved differently than she predicted. Sometimes children focus on the material instead of the weight and perceive the object to be light.

Activity #3 B: Follow up to Homework:

You Need: 10 items including a ball of aluminum foil and a large heavy object like a wooden scrub brush
large clear container of water
erasable marker

As a follow up to their homework, we repeat the experiment in class in groups. This time the students concentrate on size: small, medium, and large as well as weight. This gives opportunity to reintroduce the term volume of water, the amount of space an object occupies in the water. We guide the students to see that size and weight are factors in buoyancy.

1. In groups have the students sort several object according to weight, then size, and record information.

2. Based on both pieces of information, have the students make predictions as to floating and sinking.

3. Begin testing their predictions with the heavy objects in a clear container marking the water before and after the object has submerged.

4. Record and illustrate what has happened to the level of the water as they test all of the objects.

5. Discuss the results and write their conclusions on the board. This give the opportunity to introduce a new concept:

An object will float
if it displaces a volume of water whose weight is the same as its own;

An object will sink
if it weighs more than the volume of water it displaces.

Activity #4: Floating a soap l'ai

You need: 1/2 bar of Fels Naptha soap
clear container of water to float the soap
a carved soap l'ai
lots of paper towels

If you have not begun the unit "How are canoes carved?" you need to do so before proceeding with this activity.

Have the students predict whether the 1/2 bar of soap will sink or float in the clear container of water and explain their predictions.

Next, gently place the bar of soap on the water—and watch it sink!

Using a carved l'ai, gently place the canoe into the clear container of water. Watch what happens. It may sink or float. If it sinks, ask the students what can be done to make the canoe float. The most popular answer will be, "Carving out the inside."

All of the students will want to test their l'ai before they carve it. Caution them that the canoes need to be dry before they start to hollow them out, because the soap becomes soft and slippery when wet.

As they begin to carve away the soap, caution the students not to apply too much pressure because the soap is not like wood; it will fracture and break up quite easily. In addition to hollowing toward the bottom, they can also hollow outward to the side of the hull.

After each test the canoes must dry before further carving because the soap becomes soft and slippery.

Activity #5: Buoyancy Discovered!

In this experiment you and your students will look more closely at what makes some objects float while others sink. To do this you will create an experiment, like a scientist would, measuring the weight of an object that floats (the canoe) to the weight of the affected water—the water that is pushes aside by the canoe.

Make sure your students understand that scientists do these kinds of simulation experiments all the time. After all, we could measure the weight a canoe, but how could we measure the weight of the ocean?

You need: light wood, apple, or red pepper. Be sure to test!
a large tub that will hold a clear container
a clear container (big enough to hold the chosen object, yet small enough to fit inside of the tub)
a scale or spring scale to measure weight
a dish towel or paper towels for clean up
kitchen baster

1. Begin by introducing the scales. Have the students learn how to bring the scale back to "O" (zero).

2. Know system of measurement they are using

3. To help define the problem to be solved in the experiment, record the following on the board.

   red pepper (light object) = canoe
   large tub = land around the ocean
   clear container = ocean

4. Just as scientists create simulated experiments to understand what happens in real life, the students will calculate why some objects sink and some float. This is done by comparing the weight of the red pepper (canoes) to the weight of the water that is affected by the red pepper. (refer back to Activity #2 B).

5. Restate and write on the board the problem as:

   Comparing the weight of the object that floats
   to the weight of the water
   that is spilled out by the object.

6. The students should help in the measuring and recording of weights for the large tub, the object (red pepper).

7. Place the clear container into the tub and fill it with water—all the way to the top! Use a kitchen baster to fill it to the very top. (Practice this ahead of time so that you can do it skillfully.)

8. Using the dish towel, and without jarring the container, gently wipe away all of the water that has spilled into the tub and on the sides of the container. You don't want to be measuring excess water!

9. Ask the students to predict what is going to happen when you place the red pepper (canoe) into the water.

10. Then gently place the red pepper (canoe), into the water and watch the water spill out of the container.

11. Introduce the term "displaced water" by writing on the board:

> Displaced water is the water that is pushed aside and is spilled out by the object

12. Ask the students to draw their observations and to make a prediction on the weight of the displaced water in the tub.

My prediction is— compared to the weight of the object the displaced water will weigh:		
More	**Same**	**Less**

13. Gently remove the "canoe" from the clear container and then the clear container from the tub without spilling any water.

14. As a group, determine what mathematical function needs to be used

15. Transfer their knowledge into the following formula:

> weight of the tub and displaced water _____
> (minus) the weight of the tub —_____
> (equals) the total weight of displaced water _____

16. With partners the students can make their calculations in their journals comparing the weight of the displaced water and the weight of the object.

17. For closure, ask the students to write and draw in their journals their conclusions to the "Guiding Question: What makes a canoe float?"

Buoyancy Testing Instructions Form:

Test #1 - Weight

You need: 10 items from your house
Sink and towel
Buoyancy Testing Instructions Form

1. Collect ten objects in your house to test if they sink or float.
2. Sort these object by weight: light, medium, heavy. This you can do by just lifting and making a judgment.
3. List each of the objects according to Light, Medium, or Heavy in the first column of the attached graph.
4. Sketch the object in the second column.
5. Predict if the object will sink or float in the third column.
6. Test the object and record your observations in the fourth column.
7. In the fifth column, write down your ideas regarding what happened with this item.

   (Perhaps a light object, which you predicted would float, actually sank!
   Or a heavy object, which you predicted would sink, actually floated!)

Concept/Topic: Canoe	Week 2

Buoyancy Testing Form:

Name:_____ Date:_____

Parent signature:_____

Fill in this chart using the ten Light, Medium and Heavy Objects.

Light Weight Objects	Sketch	Prediction S or F	Result S or F	My Idea Why
Medium Weight Objects	**Sketch**	**Prediction S or F**	**Result S or F**	**My Idea Why**

Buoyancy Testing Form:

Heavy Weight Objects	Sketch	Prediction S or F	Result S or F	My Idea Why

Concept/Topic: Canoe	Week 2

Investigate the properties of a lump of clay.

1. Give each student equal amounts of clay
2. Let students experiment with clay and try to make it float
3. Once students create something that floats use marbles or pennies to see if it can hold weight
4. Write outcomes on sentence strips and sequence the project

Science Journal

After the children have had time to explore and experiment, these journal story starters can be used in their science journals. These sentences can be copied and pasted into their journals. (see attached)

You may want to do one of the responses in a guided writing/whole group situation at least once so that the children understand what you want. Doing it on the overhead is also an option to model journal response.

1. When I pushed on the balloon, I noticed ...

2. When the jug was in water, I noticed ...

3. I wonder why...

Evaluate team cooperation and appropriate student behaviors at the water table by adding a response about:

What behaviors did you notice at the water table today that helped our team work well together?

How can we improve and help each other tomorrow when we do more water activities?

You can also create a class rubric for a positive work time at the water station and discuss and evaluate the team efforts.

Concept/Topic: Canoe	Week 2

Science Journal Form

Date _____Name _____

Concept/Topic: Canoe	Week 2

Procedure Plan for Writing

Frame Work

Topic: How to Make a Canoe

Goal or Aim: What is the goal or what is to be done?

Requirements: What is needed to complete this task?
Materials and tools?

1.

2.

3.

4.

5.

6.

Steps or Method: Step by step, sequential- following first to last
What is to be done?
How will it be done?

1.

2.

3.

4.

Sentence Strips

The canoe maker is selecting a red cedar tree.

He thanks the tree for its wood to make a canoe.

They are felling the tree by burning and chiseling.

They are splitting the tree with maul and wedges.

They are hollowing out the canoe.

They are steaming the canoe to make it wide.

They are finishing the canoe. They add the bow and stern, paint the inside and char the outside.

***Teacher note:** These sentence strips can be copied and cut apart and used as the text to guide children in illustrating a retelling of *How To Make A Canoe.*

The verbs have been underlined to help the children see exactly what their picture must include, and to teach the concept of text clearly matching pictures in a picture book. You could also create another kind of text with a circular format illustrating the life cycle of a canoe. Photographs of these steps would also be valuable to use in this sequencing activity.

The photos could be scanned to use in small student books, or the children could orally retell using the pictures to support their sharing to the group. See attached bibliography and teacher support materials list.

*This story is a rich example of TEAMWORK and sharing skills and talents toward a common goal.

How Big Will My Canoe Be?

Procedural Text

The children will be looking carefully at a “teaching text” which tells them the story of how canoes are created, step by step. It would be great to have other procedural texts available to share so that you can point out features of the text, how they are organized. You can compare them with "once upon a time" stories and compare the different text formats, what the author needed to know to write each, and the form and purpose of each kind of book.

Have students help you create a language experience chart retelling the steps to create a canoe. Highlight sequence words such as

First
Second
Next
Then
After that
Finally
etc.

Draw children's attention to how writing directions on how to create or build something requires that we sequence things very carefully.

Tools used	Sequence (Steps to Build a Canoe)
1.	
2.	
3.	
4.	
5.	
6.	
7	

This format could be used on a large shared writing chart, or as an individual journal page to launch the children into their rewrite of how a canoe is created.

Concept/Topic: Canoe	Week 2

Teacher Note:

This integrated unit will be a powerful instructional model when teachers find ways to weave instruction of core ideas into all areas of the curriculum. For example, if you are teaching the steps to create a canoe, it would be valuable to expose your children during read aloud times throughout the day to many procedural texts and How-To books. Comparing and contrasting these text forms and their features with narrative will give children a window into understanding structure long before you ask them to write their recipes, directions or How-To books.

We suggest that writing workshop and prompted writing explore procedural text structure by having children write out step-by-step recipes, favorite game rules and procedures, etc. When it comes time for your children to retell the life cycle of a canoe, they will be familiar with this text format and will find greater success and connections to their own life experiences.

Some books to share with K-2 children on procedural writing:

**Let's Bake*, Christine Economos, New Bridge Discovery Link Books. 1999

**Make a Salad Face,* David Drew, *Voyages, SRA.* 1994

**Make a Pizza Face,* David Drew. *Voyages,* SRA. 1994

**Burger Time,* Carol Taylor. *Voyages,* SRA. 1994

**Sometimes It Will Float, Sometimes It Will Sink,* David Drew. Infoactive, Celebration Press, Addison Wesley, 1997

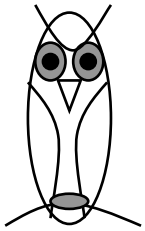
**Indian Cooking*, Fances L. Whisler, Nowega Press. 1973

Teacher Note:

Throughout this unit on the Canoe and Traditions, we have had many thoughts on how to teach comprehension and help students link these lessons to their own lives in new ways. *Mosaic of Thought*, by Keen and Zimmerman, focuses on teaching reading strategies for in-depth, explicit instruction of reading strategies. It is a gold-mine for teacher support! As students become proficient in connecting their background knowledge, visualizing, asking questions, inferring and solving problems at the word and text level, their engagement and ability to comprehend increases dramatically.

We approach the strategy of making connections to books using the OWL method in the early grades.

O What do you **O**bserve or notice
W What do you **W**onder
L **L**ink it to your life

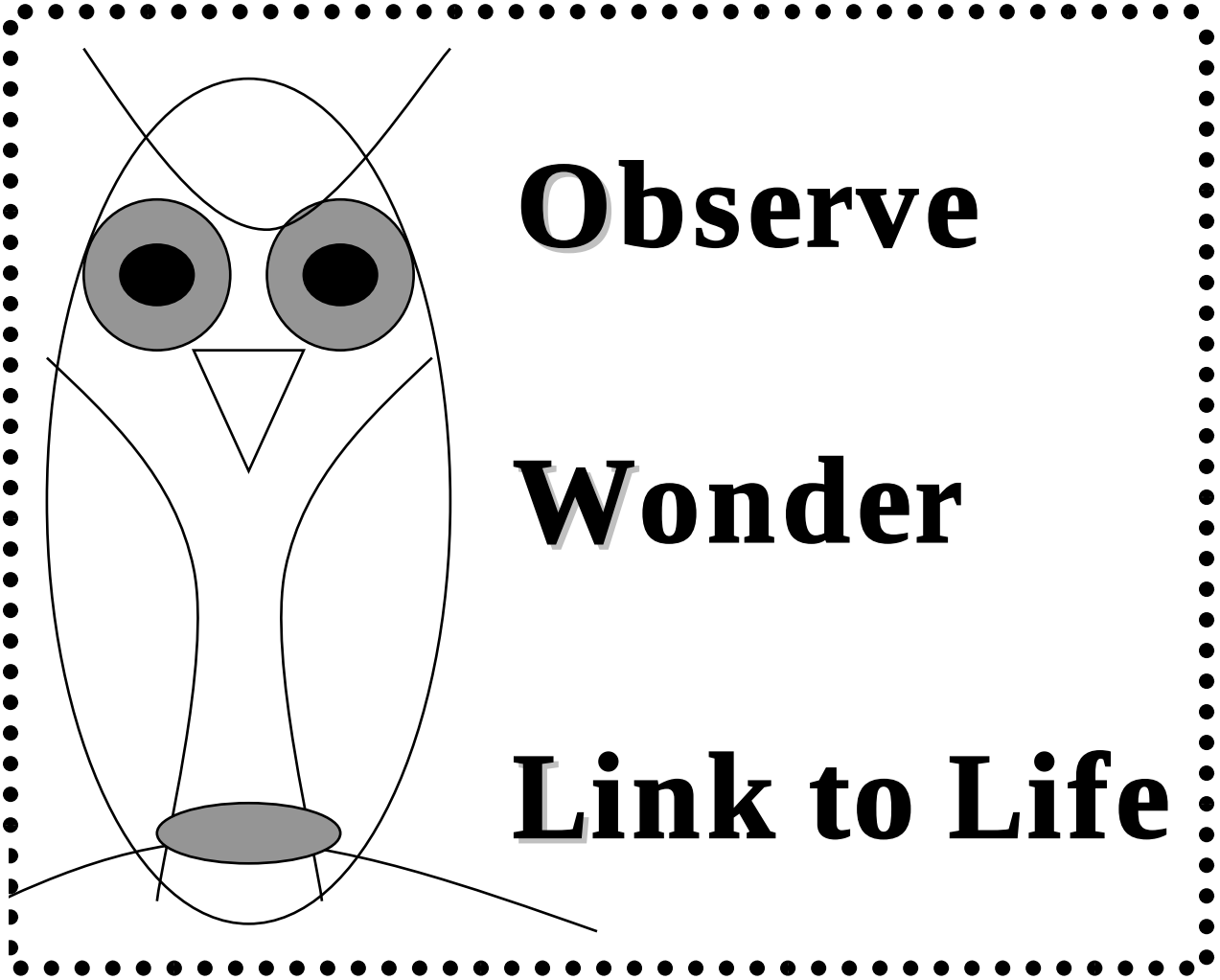


Copy the poster of the OWL strategies (C2.20) and put it near your shared reading corner. As you share picture books with children, continually model for them your observations, your questions about text and your text to life connections. Then, when the children have had many experiences with this line of "think-aloud" modeling by the teacher, they are ready to make their own connections.

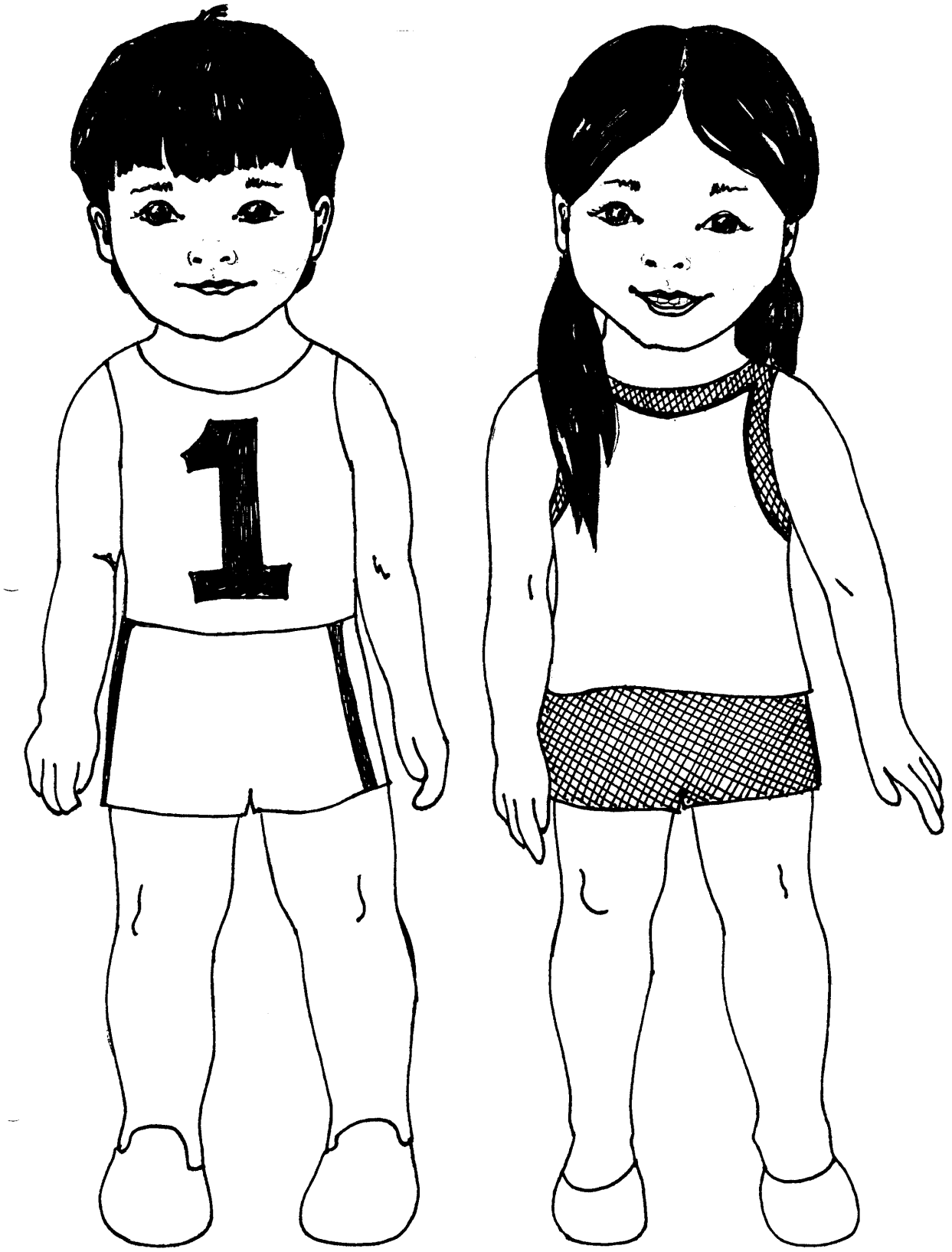
One way to introduce and use this strategy is having the children sit in a circle. Open up to a page of a book you are reading and make an observation aloud, then pass the book to the next child. They make an observation and the book is passed all around the circle. Each child has an opportunity to make an observation and share it.

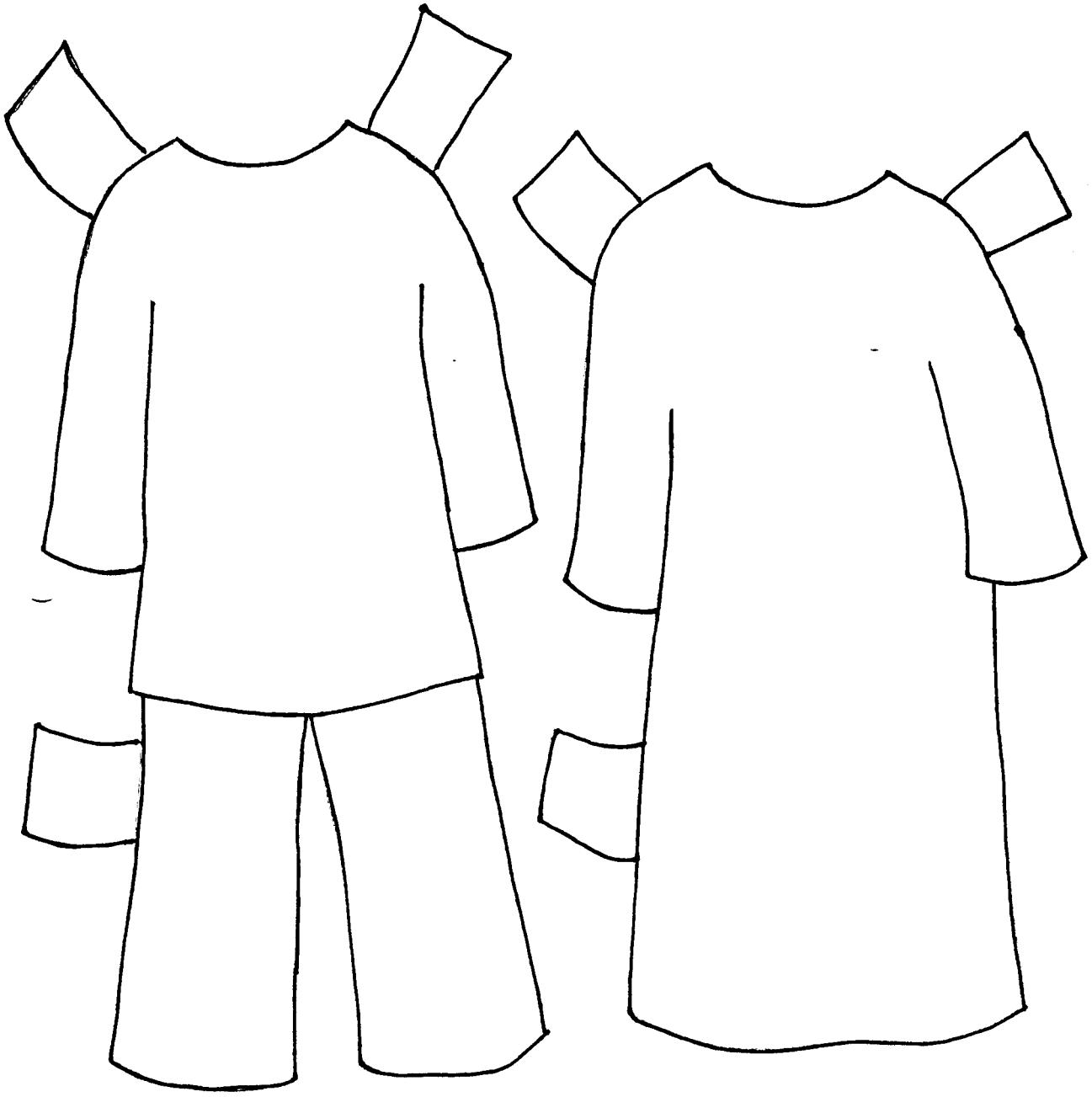
Then pass the book around again and model a question or "I wonder" about the book. If the book is at the children's reading level, they might read a passage aloud and then wonder about it. For a follow up, after reading the book again, we discuss how the book connects to experience or thought from our own life.

For guided reading/literature circles, the teaching strategies for making connections text-to-text or text-to-life are powerful models for solidifying student engagement and having discussions around a text. The teacher models connecting books to their life and often discusses how books remind them of other texts. The next step for literature circle time is to give the children post-its and ask them to mark places in their reading books that remind them of other books or their own lives as they read independently. Then , when they come to literature circles these markers become the beginning of great discussions about the books.


Observe
Wonder
Link to Life

Paperdolls





TEACHERS: Please create an authentic approximation of local tribal clothing or use the clothing outline as a template for your own creation.