Grade Level: 2-3

Materials

- *Belle of Louisville* diagram
- Math problems handout
- Math problems answer key

Technology

Calculator (if needed)

Vocabulary

Bow
Captain
Calliope
Hull
Landing Stage
Paddlewheel
Pilothouse
Pitman Arm
Steam Whistle
Rudder
Stern
Sea Chest
Smokestacks
Starboard
Escape (scape) pipes

Belle of Louisville Diagram Math

Length
1 Day

Concepts/Objectives
- Students will apply reading skills that will enable them to scan a document for information.Students will apply math concepts they have learned to math problems that have been created from information printed on a diagram of the operating parts of the *Belle of Louisville* (see Belle diagram handout).

Activities
- Students will examine the diagram of the *Belle of Louisville* and look for key words and phrases that will be used as focus for specific questions and/or math problems.
- Students will examine the diagram of the *Belle of Louisville* and look for number and statistics about the boat.
- Given a list of math problems, students will solve the problems using information they can locate on the diagram of the boat.

Belle Resource
Viewing of the full video will provide useful background information for this lesson.

Instructional Strategies and Activities

"I can use text features to locate information needed to solve real-world problems."

"I can use real-world resources and apply math skills I have learned to solve math problems."

Teacher will distribute copies of the *Belle of Louisville* diagram. With teacher guidance and help with pronunciations of terms printed on the diagram, students will examine the diagram to locate information requested (see Reading for Information worksheet).

After sufficient time for the students to become familiar with the diagram, the teacher will introduce the math problems for today's lesson (see Primary Math – *Belle of Louisville* diagram worksheet.) Teacher will instruct the students to use information from the diagram to answer the questions on the worksheet.

A self-check station should be set up for students to check their answers to the problems on the worksheets. Students should then report their scores to the teacher in the manner the teacher decides.

After students have scored and turned in their work, the following additional activity or homework will be assigned:

> Students will use the *Belle of Louisville* diagram and will create two math problems similar to those they completed in class today.

> (Teacher will review the questions and assign a value as is appropriate for the class.)

Support/Connections/Resources

The *Belle of Louisville* diagram attached can also be found in the booklet, *Belle of Louisville: A Window to the Past, A Door to the Future*.

Information from the booklet can be used for other lessons or for supplemental resource materials for the class.

Multiple Choice Questions

1. The feature of the *Belle of Louisville* that was once the only way to transfer passengers and freight is called the
   a. hull
   b. pilothouse
   c. smokestack
   d. boarding stage

2. Another name for the Captain's Quarters is the
   a. Texas Cabin
   b. calliope
   c. sea chest
   d. draft

3. The _____ are opened for quick bursts of power.
   a. fuel tanks
   b. bridge
   c. Pitman Arm
   d. 'scape pipes

Kentucky Academic Content

Core Content

MA-P4-1.3.1
MA-P4-2.2.3
MA-P4-5.3.1
RD-P4-2.0.3
RD-P4-2.0.4
RD-P4-2.0.7
RD-P4-5.0.3

Answer Key for Multiple Choice Questions

1. d
2. a
3. d
4. b
5. b
6. a

4.	The section of the boat that takes on river water to feed the boilers is called the
	a.	bridge
	b.	sea chest
	c.	pilothouse
	d.	calliope

5.	The two main materials of which the paddlewheel is made are
	a.	roses and linen
	b.	steel and oak
	c.	oil and water
	d.	tin an plastic

6.	The three rudders work in tandem. Tandem means
	a.	together
	b.	forcefully
	c.	in a circular motion
	d.	quickly

Handouts/Worksheets/Graphic Organizers

- 	*Belle of Louisville* diagram (see "Related Instructional Resources")
- 	Primary Math problems handout (attached)
- 	Answers to Primary Math problems handout (attached)
- 	*Belle of Louisville: A Window to the Past, A Door to the Future* (available by contacting Kadie Engstrom, Education Coordinator, Belle of Louisville, (502-574-2992 or toll free 866-832-0011).

PRIMARY MATH WORKSHEET

Examine the diagram of the *Belle of Louisville*. Use clues from the diagram to answer the questions below.

1. The steel hull and the bow have both increased in size since the boat was built. Calculate the sum of the number of feet that the bow has been extended and the number of feet that the steel hull has been widened. Show your work in the space below.

2. The fuel tanks of the *Belle of Louisville* can hold 22,000 gallons of fuel oil. If the fuel oil costs $2.00 per gallon, what is the cost of filling the fuel tanks with fuel oil one time? Show your work in the space below.

3. The *Belle of Louisville* burns about 150 gallons of fuel oil per hour at full speed. Calculate the number of gallons of fuel oil is burned per minute. Show your work in the space below.

4. Use information from the diagram; calculate the sum for the following:

a. The number of rudders

[ ]

b. The number of small steam whistles on the calliope

[ ]

c. The number of sections named "deck"

[ ]

d. The number of boilers

[ ]

e. The number of pipes on the steam whistle

[ ]

f. The number of watertight compartments in the steel hull

[ ]

g. The number of smokestacks

[ ]

h. The number of steam engines

[ ]

i. The number of feet the bow was extended in 1968

[ ]

j. The number of paddlewheels on the *Belle of Louisville*

[ ]

_____

The total equals the number of years since
the *Belle of Louisville* was first constructed (as of 2009).

PRIMARY MATH WORKSHEET ANSWER KEY

Examine the diagram of the *Belle of Louisville*. Use clues from the diagram to answer the questions below.

1. The steel hull and the bow have both increased in size since the boat was built. Calculate the sum of the number of feet that the bow has been extended and the number of feet that the steel hull has been widened. Show your work in the space below.

Number of feet bow has been extended	=	**10 feet**
Number of feet the steel hull has been widened.	=	**5 feet**
TOTAL		**15 feet**

2. The fuel tanks of the *Belle of Louisville* can hold 22,000 gallons of fuel oil. If the fuel oil costs $2.00 per gallon, what is the cost of filling the fuel tanks with fuel oil one time? Show your work in the space below.

   22,000 x 2.00 = 44,000   **Total Cost: $44,000**

3. The *Belle of Louisville* burns about 150 gallons of fuel oil per hour at full speed. Calculate the number of gallons of fuel oil is burned per minute. Show your work in the space below.

   150 gallons per hour divided by 60 minutes in an hour = 2.5 gallons per minute

4. Use information from the diagram; calculate the sum for the following:

a. The number of rudders

3 ☐

b. The number of small steam whistles on the calliope

32 ☐

c. The number of sections named "deck"

4 ☐

d. The number of boilers

3 ☐

e. The number of pipes on the steam whistle

3 ☐

f. The number of watertight compartments in the steel hull

35 ☐

g. The number of smokestacks

2 ☐

h. The number of steam engines

2 ☐

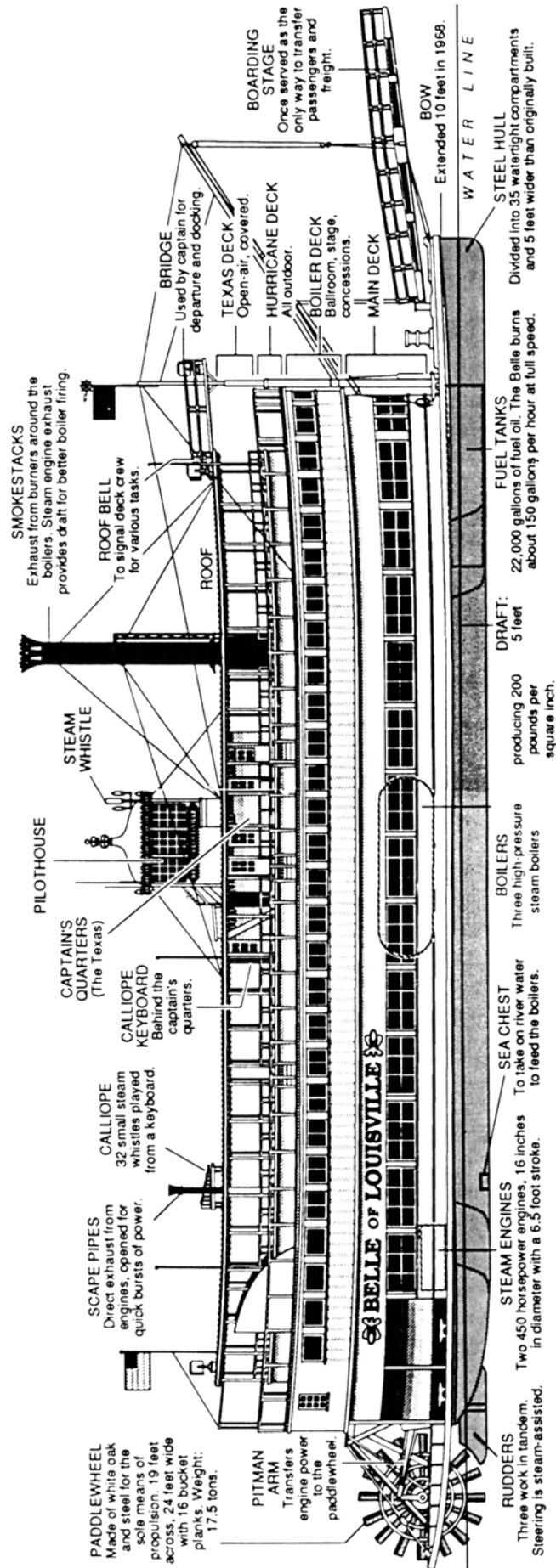i. The number of feet the bow was extended in 1968

10 ☐

j. The number of paddlewheels on the *Belle of Louisville*

1 ☐

The total equals the number of years since
the *Belle of Louisville* was first constructed (as of 2009). **95**

A Diagram of the Belle

SMOKESTACKS
Exhaust from burners around the boilers. Steam engine exhaust provides draft for better boiler firing.

ROOF BELL
To signal deck crew for various tasks.

ROOF

BRIDGE
Used by captain for departure and docking.

TEXAS DECK
Open-air, covered.

HURRICANE DECK
All outdoor.

BOILER DECK
Ballroom, stage, concessions.

MAIN DECK

BOARDING STAGE
Once served as the only way to transfer passengers and freight.

BOW
Extended 10 feet in 1968.

WATER LINE

STEEL HULL
Divided into 35 watertight compartments and 5 feet wider than originally built.

STEAM WHISTLE

PILOTHOUSE

CAPTAIN'S QUARTERS
(The Texas)

CALLIOPE KEYBOARD
Behind the captain's quarters.

CALLIOPE
32 small steam whistles played from a keyboard.

FUEL TANKS
22,000 gallons of fuel oil. The Belle burns about 150 gallons per hour at full speed.

DRAFT:
5 feet

producing 200 pounds per square inch.

BOILERS
Three high-pressure steam boilers.

SEA CHEST
To take on river water to feed the boilers.

SCAPE PIPES
Direct exhaust from engines, opened for quick bursts of power.

STEAM ENGINES
Two 450 horsepower engines, 16 inches in diameter with a 6.5 foot stroke.

BELLE of LOUISVILLE

PADDLEWHEEL
Made of white oak and steel for the sole means of propulsion. 19 feet across, 24 feet wide with 16 bucket planks. Weight: 17.5 tons.

PITMAN ARM
Transfers engine power to the paddlewheel.

RUDDERS
Three work in tandem. Steering is steam-assisted.

The Courier-Journal