WHAT A MACHINE!

You can use Poster 4 with this storybook.

Story Synopsis

Harry, the hero of this chapter book, loves to make things. So no one is surprised when he offers to make breakfast for hundreds of people at the Fun Fair. They are surprised, however, when Harry says he can do it all alone. In the week before the fair, Harry follows his routine very carefully, which helps him to think and work. He gets materials from people all around town, but doesn't share his plan. The day of the fair, Harry sets up his machine and starts to pedal the bike. It works! Everyone loves the flipping, sliding, turning machine that Harry built, and the food is delicious, too.

LITERACY ELEMENTS

speech bubbles
commas for lists: e.g., flip, slide, and turn
chapter divisions

MATH CONNECTIONS

GEOMETRY AND SPATIAL SENSE
demonstrating translations and building models

WORDS TO DISCOVER

identify the alternate spellings and meanings for homophones/homonyms: e.g., no, knew, fair, one,
identify multiple meanings for homographs: e.g., can, well, left, saw

ESL CONSIDERATIONS

As you read, pause to talk about what Harry got done every day. Make lists for each day and ask volunteers to act out the activities.

Overall Learning Opportunities

Students will:
- understand key concepts in transformational geometry
- build 3-dimensional objects and models

Students will:
- read a variety of simple written materials for different purposes
- read aloud in a way that communicates the meaning
- read independently, using reading strategies appropriate for Grade 2
- express clear responses to written materials, relating the ideas in them to their own knowledge and experience

ACTIVITY MENU

Investigation: Flips, Slides, and Turns, page 108

Guided Reading, pages 109–111

As a Group, pages 112–113

- *Moving Shapes:* using 2-dimensional shapes to demonstrate transformations
- *Make a Structure:* exploring model making using 3-dimensional shapes
- *What a Machine!:* conceptualizing a machine and creating a representation of it
- *What Is It?:* inventing ideas for machines and creating detailed drawings

Home Connections, page 114

- *BLM 49:* finding examples at home and creating models together

Independent Work, pages 115–119

- *BLM 50:* using pattern blocks to demonstrate transformations
- *BLM 51:* exploring the differences among geometric shapes
- *BLM 52:* drawing structures and identifying the shapes that are used
- *BLM 53:* practising how to define words
- *BLM 54:* practising ordering events and finding information

Flips, Slides, and Turns

LEARNING OPPORTUNITIES

Students will:

- demonstrate transformations such as flips, slides, and turns using concrete materials
- identify and perform translations of simple figures using concrete materials

YOU WILL NEED

- construction paper
- scissors and glue

OBSERVING FOR ASSESSMENT

Can the student:

- correctly identify flips, slides, and turns?
- re-create their understanding of motions with concrete objects?

TEACHING tip In the classroom, point out the motions of flips, slides, and turns as they occur naturally throughout the day. For example, you can indicate to children that you are flipping a page on a flip chart, that someone is sliding down a slide, and that the hands are turning on a clock.

Reading the Story

After reading the story, revisit pages 22 and 23. Ask:

➤ What motions does Harry's breakfast-making machine make?

Print the words *flip*, *slide*, and *turn* on chart paper. Have children point out and then describe the machine parts that are flipping, sliding, and turning.

Starting the Investigation

Discuss and demonstrate the meaning of the words *flip*, *slide*, and *turn*. Then provide each child with a large sheet of paper, a folded piece of construction paper, scissors, and glue. Have children cut out an irregular shape from the folded construction paper so that they have two congruent shapes. Children should glue one of the shapes onto the middle of the large sheet of paper. They will use the second shape to demonstrate a flip, a slide, and a turn in response to your directions. After each response, children return the second shape so it fits exactly on top of the glued shape.

Note that your directions can be given as a game of Simon Says. For example, you might say:

➤ Simon says slide your shape down the side of your chair. Now put it back so it is in the same position as your glued shape.

Working on the Problem

Have children continue to play Simon Says with a partner. Once children are comfortable with the process, ask them to take their second shape and do a flip, a slide, or a turn in which they land somewhere else on the paper. Guide them in then gluing their shape onto this spot on the page.

Have children then label the page to indicate which of the 3 motions they performed (either a flip, a slide, or a turn) and the direction in which they made the motion happen (left, right, up, or down).

Sharing Solutions

Gather as a group and sort and display the sheets. Ask:

➤ In which group do we see the shape still facing the same direction?
(slide)

➤ In which group do the shapes move in a circle?
(turn)

➤ In which group do the shapes look like a mirror image of the other shape?
(flip)

Extension

Have children join with a partner to play a game. The pair makes 3 cards, labelled *flip*, *slide*, and *turn*, respectively, and turns them face down. The first player places a pattern block on a flat surface, then turns over one of the 3 cards. The second player responds by selecting a similar pattern block, placing it on top of the first pattern block, then picking it up and moving it according to the motion written on the card. Have the children switch roles and continue.

Children can also use pattern blocks to perform flips, slides, and turns on **Blackline Master 50**.

BLM Page 115

Guided Reading

LEARNING OPPORTUNITIES

Students will:

- retell a story in proper sequence, identify the main idea and the characters, and discuss some aspects of the story
- express their thoughts and feelings about ideas in a piece of writing

YOU WILL NEED

- some simple machines and magazine pictures
- colouring materials

OBSERVING FOR ASSESSMENT

During *Reading the Text*, does the student:

- use the pictures as a complement to understanding the storyline?
- participate in the conversation by offering answers to the questions you ask, or ask his/her own questions?

Setting the Scene

Display some simple machines. Engage children in talk about some of the machines you've displayed. Ask:

➤ What is this machine called? Do you know why?

Help the children to connect the name of the machine with its purpose (egg beater) so that by the end of the discussion the children will understand what a machine is.

If there are machines in other locations in the school, such as the school office, that you don't have in your classroom, take the children to those locations to look at, talk about, and watch as they perform their tasks (a printer printing, a scanner scanning, a copier copying).

When the discussion is complete, ask:

➤ What is meant by the word "machine"?

Record the children's definitions.

Have the children look at the title of the book. Ask:

➤ Why the exclamation point? How does it change the way we read the title? How does it change the way we think about the machine we're going to be reading about?

Have the children explore the cover art. Ask:

➤ What do you see in the picture that tells you something about what the story will be about?

Explain to the children that this is a chapter book. Ask:

➤ What is a chapter book? How is a chapter book different from other storybooks?

➤ Why does an author decide to make a book a chapter book?

Say to the children:

➤ One thing you can do with a chapter book is read a chapter and then put the book down for a while. And that's what we'll be doing with this book.

Reading the Text

- Turn to Chapter 1, which begins on page 2. Ask:

➤ What's the title of this chapter?

➤ How does the chapter title help us to read the chapter?

➤ With the title, what should we expect to happen in the first chapter?

➤ Look at the picture on these pages. This is a Town Meeting. Harry is at the meeting. How do you think Harry is feeling right now? Why do you think that?

Say to the children:

➤ You should know some things about Harry before you read about him. Harry loves to make things. Harry loves to solve problems. Harry gets excited about ideas. Look at the bulletin board in the picture. What is on the Town Meeting agenda on that particular day?

➤ One of the subheadings interests Harry a lot. Read this page to find out what Harry offers to do and why he's smiling and looking so happy in the picture.

Have the children turn to page 4. Say:

➤ One thing that Harry likes to do is to make plans, because he thinks it's important. Read pages 4 and 5 to find out how Harry gets started on his idea.

➤ Turn to page 6. Harry seems to be going through other people's garbage/trash. Why?

Guided Reading

TEACHING tip Spread *Reading the Text* over three days, using the chapter divisions as your guide. This gives the children the feeling of a continuous story and indicates that a book can be read at more than one sitting.

OBSERVING FOR ASSESSMENT

During independent reading, does the student:

- subvocalize when reading silently?
- finger or voice point to track his/her place in the text?

Have the children turn to Chapter 2, page 7, and say:

➤ Page 7 is the beginning of Chapter 2. How do we know that?

➤ What is the title of this chapter? Show us where you see the title.

➤ Read page 7 to find out what Harry is looking for. How is Harry feeling now? How do you know?

Invite a child to read the part that tells us how Harry is feeling. Say:

➤ Another place that Harry looks for stuff is at garage sales. Read page 8 to find out where he went and what he came home with.

➤ Let's look at the picture on page 9. What is the lady asking Harry? What does Harry reply?

➤ Read pages 10 and 11 to find out why he likes trash and what he found in Mrs. Chang's trash can.

➤ Turn to page 12. In the picture, Harry is looking at a plastic shower curtain. Where would he go to find a collection of shower curtains?

➤ What is he asking Mr. James? Mr. James has a question for Harry. What is that question?

➤ Read pages 12 and 13 to find out what he did with the plastic shower curtain.

Have the children turn to pages 14 and 15. Say:

➤ Look at the picture. It's Wednesday morning. Where is Harry now? How do you know? Read this page to find out what Harry buys at the hardware store.

➤ Turn to pages 16 and 17. On Thursday, Harry went to Jan's Auto Shop. Read these pages to find out 2 things:

- What did he hear that made him think of Jan's Auto Shop?
- What did Harry ask Jan to do for him?

Have the children turn to pages 18 and 19 and look at the picture. Say:

➤ On Friday morning, Harry goes to the grocery store. Everyone seems to want to help Harry with his plan. Read what the cashier is asking Harry. Now read to find out how we know that Harry bought a lot of food at the grocery store.

Stop the instruction. Invite the children to work alone, in pairs, or in small groups of three to decide what Harry's idea looks like. Have the children make a picture of what they think it looks like. Later in the day, or the next day, as a lead in to the *Reading the Text* session, have the children share and talk about their pictures.

Have the children turn to Chapter 3, page 20, and look at the picture. Ask:

➤ Is there any clue in the picture to tell us how Harry's invention works? Tell us about what you see.

➤ When you read this page, you'll find out how Harry's breakfast-making machine works. It flips, it slides, and it turns. But does it work? Read pages 21 and 22 to find out.

Say to the children:

➤ Look at the picture on pages 22 and 23. Now look at the picture on page 24. A difference in the 2 pictures is the sign in front of Harry's invention. What does the sign say?

➤ Read page 24 to find out how Harry knows his plan worked.

- Have the children read the whole book independently.

Guided Reading

After Reading

Say to the children:

➤ Do you remember at the beginning of the story when everyone was worried because they couldn't figure out what Harry was doing? How did they feel about his work at the end of the story? How do you know that?

Revisit the Story

Engage children in a conversation about the story by using open-ended prompts:

➤ Were there any words that gave you a struggle? Which ones? What did you do?

➤ Did you enjoy this story? Why? Why not?

➤ Could this story really happen? Why? Why not?

➤ What did you enjoy most about Harry as the main character in the story?

➤ Would you like to try Harry's breakfast? Why? Why not?

Focus on Harry as a character by asking:

➤ What are some words that describe Harry? Why do you think so?

➤ Do you think that when Harry was in Grade 2 he was a good student? Why do you think that?

➤ Why were the people concerned about what Harry was buying for the breakfast?

Focus children on the way the story is told through pictures. Say:

➤ Turn to page 2. Let's look at and talk about each picture and tell the story again.

Reinforce the Story

Use **Blackline Master 54** to have the children review the story by sequencing the events and identifying the page numbers where the information was found.

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As a Group

LEARNING OPPORTUNITIES

Students will:

- demonstrate transformations using concrete materials
- identify and perform translations of simple figures

YOU WILL NEED

- chart paper
- paper shapes cut from BLM 51
- paper and glue

OBSERVING FOR ASSESSMENT

Can the student:

- identify and demonstrate a flip, slide, and turn?

Activity: Moving Shapes

Revisit the breakfast-making machine that Harry made and discuss the meaning of the terms: *flip*, *slide*, and *turn*. Then work with the class to create reference posters that demonstrate a shape flipping, sliding, and turning in different directions. Next, display sets of paper shapes cut from **Blackline Master 51**. Post one on a piece of chart paper and label it "Flips." Ask a volunteer to select a congruent shape, place it on the posted shape, and then flip the shape from top to bottom. Glue the shape in place on the chart paper, and label the direction and motion.

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Ask a volunteer to find another congruent shape, place it on top of the original, and then flip it in a different direction. Again, glue and label it.

Repeat the process, this time by flipping from left to right and then from right to left. Once children understand the idea, brainstorm and list other motions and directions they could try. Then, assign a different motion and direction to each pair of children. Have the pair represent and label the motion and direction by gluing two congruent shapes in appropriate positions on a piece of paper. Then sort these records according to categories and post them for use as a class reference.

Extension

Some children may enjoy the challenge of using a set of similar pattern blocks to create a pattern based on flips, slides, and turns. For example, they may wish to arrange the green triangles to show a "flip, flip, slide" pattern or a "slide, turn, slide" pattern.

LEARNING OPPORTUNITIES

Students will:

- explain how they used 3-dimensional figures and concrete materials in building a structure
- explore and identify 3-dimensional figures using concrete materials

YOU WILL NEED

- 3-dimensional figures
- real world "recyclables" for constructing models (boxes, wood scraps and blocks, cardboard tubes, foam balls, cone-shaped cups, straws)
- materials for fastening (tape, glue, string)
- large containers for storing the recyclables

Activity: Make a Structure

Remind children how Harry in the book *What A Machine!* started to work on his invention by creating a plan. Ask:

- How did his plan help him?
- What materials did he use to construct his machine?

Display 3-dimensional figures, such as a cube, sphere, cylinder, cone, rectangular prism, and pyramid. Ask children to name and describe each one.

Place the 3-dimensional figures as "labels" for different containers. As the recyclables come in, children can talk about them and sort them into the appropriate containers. When the collection is large enough, challenge children to examine the materials and decide what they would like to make.

Have them create a plan for their model or structure and then choose the materials they need. When complete, ask children to write about their model. Provide time for children to explain how they used different 3-dimensional figures and concrete materials in building their structure or model.

Extension

Blackline Master 52 can be used to help children record the shapes they used in their model or structure.

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As a Group

LEARNING OPPORTUNITIES

Students will:

- create simple media works
- identify nouns as words that name things

YOU WILL NEED

- colouring materials
- a variety of building materials e.g., Lego, Meccano

OBSERVING FOR ASSESSMENT

Does the student:

- work co-operatively?
- label the picture(s) using nouns?

Activity: What a Machine!

Have the children invent their own breakfast-making machine, using their bodies as the various machine parts. For example, one child assumes the position and posture of the start-up bicycle; another child acts as one of the belts, and so on.

For ideas, the children can refer to the pictures on pages 20–24 of *What a Machine!*

Have the children draw a picture of their breakfast-making machine and use nouns to label the various parts. Encourage them to use well-chosen nouns to label the machine parts, i.e., avoid the word "thing."

Extension

Challenge the children, in the same groups, to use a variety of construction materials (Lego, Unifix cubes, blocks, Cuisenaire rods, Meccano, and so on) to make a representation of the machine. The machines can be given a name and put on display for others to view.

LEARNING OPPORTUNITIES

Students will:

- create simple media works
- participate in group discussions, demonstrating a sense of when to speak, what to say, and how much to say

YOU WILL NEED

- a variety of building materials e.g., Lego, Meccano

OBSERVING FOR ASSESSMENT

Does the student:

- create a machine that has a purpose and that, as designed, could fulfill the purpose?

Activity: What Is It?

Invite the children to make a list of up to five machines that they would like to invent. The machines should perform specific functions that could make their lives easier.

For example, children may wish for a homework machine, a carry-out-the-garbage machine, a clear-the-table-and-put-all-the-dishes-in-the-dishwasher machine, a bedmaking machine, and so on.

Extension

Have the children choose their favourite machine from the list of five and make a detailed, labelled picture of it. Invite them to share their pictures with the other children, but make sure that they don't say what the machine's purpose is.

For each picture, begin a discussion with the group, trying to guess the machine's function. Challenge the children to name the machine and make sure that each child in the group has a chance to contribute to the discussion.

What a Machine!

Dear Family,

We've enjoyed reading the book *What a Machine!* This storybook is part of a series called *Side By Side*. This series connects mathematics and language through reading. Spending time reading and doing math activities at home helps your child develop solid skills and concepts. Enjoy reading the story with your child.

Choose some or all of these activities to enjoy together:

- ❑ In the story, Harry is an inventor who creates a marvellous breakfast-making machine for the Town Fun Fair. Harry plans what he will make, gathers the materials, builds it, then demonstrates how the machine works. Your child might be interested in following a similar process to build a machine with moving parts. Make a plan, then gather the necessary packaging materials to construct the machine. Talk about the different shapes within the machine and the different motions it can perform.

- ❑ In the story, Harry's machine performs different motions: it flips, slides, and turns. With your child, look at pages 22 and 23 to find examples of these actions. Then look for examples of these motions in everyday situations. When observing a specific motion, give a label to the motion and tell the direction in which it is moving.

- ❑ Make a flipbook. Start by selecting a small shape to trace. Then, on a piece of paper, draw 8 horizontal lines to create 8 rows (that will be cut into strips). Begin by tracing the shape on the right end of the first row. Then move the shape straight down vertically onto the next row, but then slide it slightly to the left. Trace the shape. Repeat for the remaining rows. Then, cut out the rows into strips, staple the strips together in order on the left end of each, and flip the right end to make the shape appear to move.

Remember to send the storybook back to school with your child.

What a Machine!

BLM 50

My name is _____ . Today is _____ .

Flip, slide, and turn the blocks.

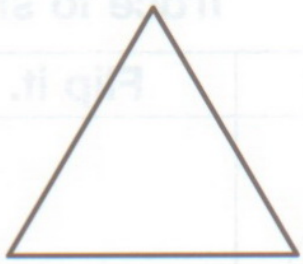
Trace to show how the shape moved.

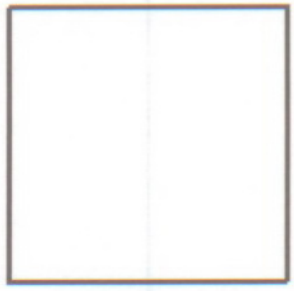
Block	Flip it.	Slide it.	Turn it.
			
			
			

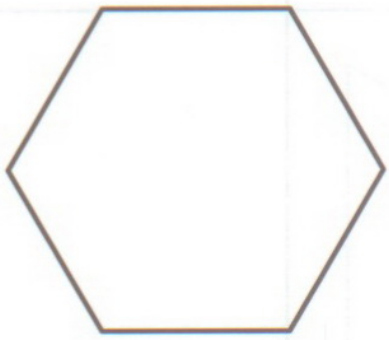
What a Machine!

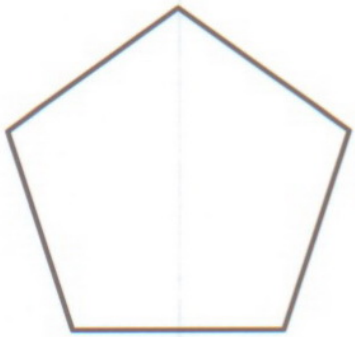
BLM 51

My name is _____ . Today is _____ .









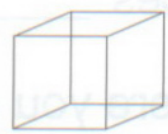
What a Machine!

BLM 52

My name is _____ . Today is _____ .

Draw a picture of the structure you made.

How many of each solid did you use?
Make a tally chart.

 sphere	 cylinder	 cone	 rectangular prism	 cube	 pyramid

What a Machine!

BLM 53

My name is _____ . Today is _____ .

Use the page numbers to help you find the words that mean:

1. the meal you eat in the morning

_____ (page 2)

2. seven days _____ (page 4)

3. where you sleep at night _____ (page 5)

4. the day after Friday _____ (page 7)

5. something you read to get the news

_____ (page 8)

6. films _____ (page 13)

7. a place to buy nails, screws, nuts, and bolts

_____ (page 14)

8. round shapes _____ (page 17)

9. a place where you can buy food

_____ (page 18)

10. the middle meal of the day _____ (page 24)

What a Machine!

BLM 54

My name is _____ . Today is _____ .

Number these events from 1 to 10, in the order they happened in the story. In the brackets, print the page number where you found the information.

___ At the third yard sale, Harry found a bicycle and a tricycle. ( )

___ Harry went to Jan's auto shop to get a big piece of metal. ( )

___ At the Town Meeting, Harry offered to make the Fun Fair breakfast. ( )

___ Harry said, "Watch how my breakfast-making machine works." ( )

___ Harry started to pedal. He pedalled hard and fast. ( )

___ When Harry got home, he started to make plans. ( )

___ Harry hurried to The Bath Shop to buy a shower curtain. ( )

___ Harry found an egg beater and a clothesline in Mrs. Chang's trash. ( )

___ Harry bought a lot of things at the hardware store. ( )

___ At the grocery store, Harry bought pancake mix, eggs, and bread. ( )