

# Blackline Masters

## Motion

### Kit #16

Revised January 2006  
Removed Word Search Jan. 2014

OCM BOCES Science Center

Student's Name: \_\_\_\_\_

Date: \_\_\_\_\_

Science Kit Activity: \_\_\_\_\_

Journal



**Student Science Journal Rubrics**

Score	Criteria	Comments
3	The writing/drawing shows detail and accuracy in recording observations; The child uses rich science vocabulary, and is able to answer related questions.	
2	The writing/drawing includes mostly accurate details; some may be inaccurate or missing.	
1	The writing/drawing shows partial knowledge; lacks detail.	
0	There is little or no response, or the writing/drawing is inaccurate or unrelated.	

Name: \_\_\_\_\_

Date: \_\_\_\_\_

# My Science Journal

## How did I do?



I am looking at my journal entry about \_\_\_\_\_

Color one

1. Did I organize my writing and pictures so that my journal is easy to understand?



2. Did I use words and pictures to tell what I did and observed?



3. Did I use science words in my writing?



4. Does my journal tell the story of what I am doing and learning in science?



Complete these sentences.

5. What I like best about my science journal is \_\_\_\_\_

\_\_\_\_\_

6. In my next journal section I will try to \_\_\_\_\_

\_\_\_\_\_

7. A question or problem that I have with my science journal is \_\_\_\_\_

\_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

# Our Science Group

How well did we work together?

Who was in our science group:

Color one

1. Our group was able to work together to get our science work done.



2. Each person in our group was able to participate. Everyone was able to share his or her ideas.



3. Our group was able to follow directions.



4. If I was an employer I would hire our group to do this work.



Working with a group of people can make the work easier. Sometimes working with a group of people can make the work harder. Think about your group for science and complete these sentences.

6. Our group had problems \_\_\_\_\_  
\_\_\_\_\_

7. Our group worked best at \_\_\_\_\_  
\_\_\_\_\_

Name: \_\_\_\_\_

Date: \_\_\_\_\_

# Science Skills

Read each statement.

Check the boxes to tell about your science journal.

	I did great!	I did okay.	I need to work on this.
1. I described what I saw.			
2. I used accurate measurements. I used careful details.			
3. I described what was the same and what was different.			
4. I used pictures to help tell what I saw or did.			
5. I labeled my pictures.			
6. I used the information I collected to draw a conclusion.			



## Happy and Sad Ball Observations

You have two balls in front of you. Each ball wanted to be chosen for the Science Center bouncing ball activity. One was chosen and one was not. One is the Happy ball and one is the Sad ball but which is which? Your job is to compare the properties of the two balls and decide.

1. What property of the balls is important to be chosen for the science activity?

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2. How are you going to find out which ball is happy or sad?

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3. Decide which one is the Happy ball. Write a sentence telling why you chose that ball as the Happy ball.

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4. Use a Venn Diagram to compare all the properties of the two balls. You should be able to think of at least 4 properties. (Ask your teacher where you should draw your Venn diagram.)

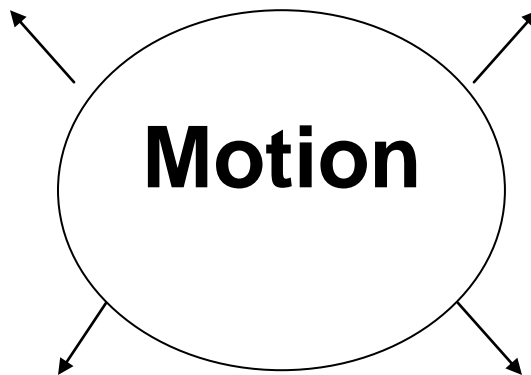
**Defining Motion.**

Fill in the squares with words that tell about the term **motion**.  
You may use words from the Word Bank below.

Checkpoint



<p><b>What is it?</b></p>	<p><b>What causes it to happen??</b></p>
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<p><b>Riddle: When are you still and moving at the same time?</b></p>	<p><b>Give 2 examples of you in motion.</b></p>
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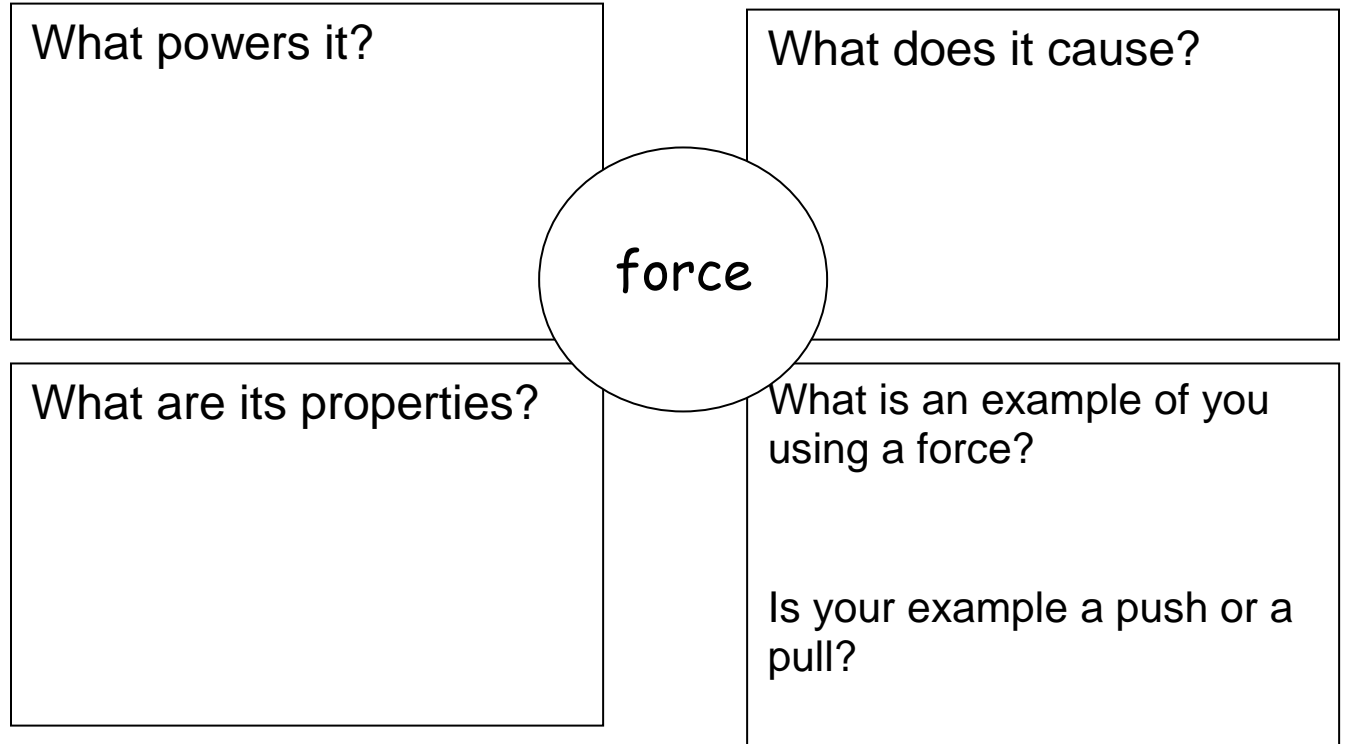
Word Bank:

change	push	pull	energy	same	position
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# Marble-ous Questions About Force



Fill in the squares with words that tell about the term "force."  
You may use words from the Word Bank below.



### Word Bank

force	push	pull	energy	motion	transfer of energy
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Write 2 sentences about shooting a marble. In each sentence use one of the words listed in the Word Bank.

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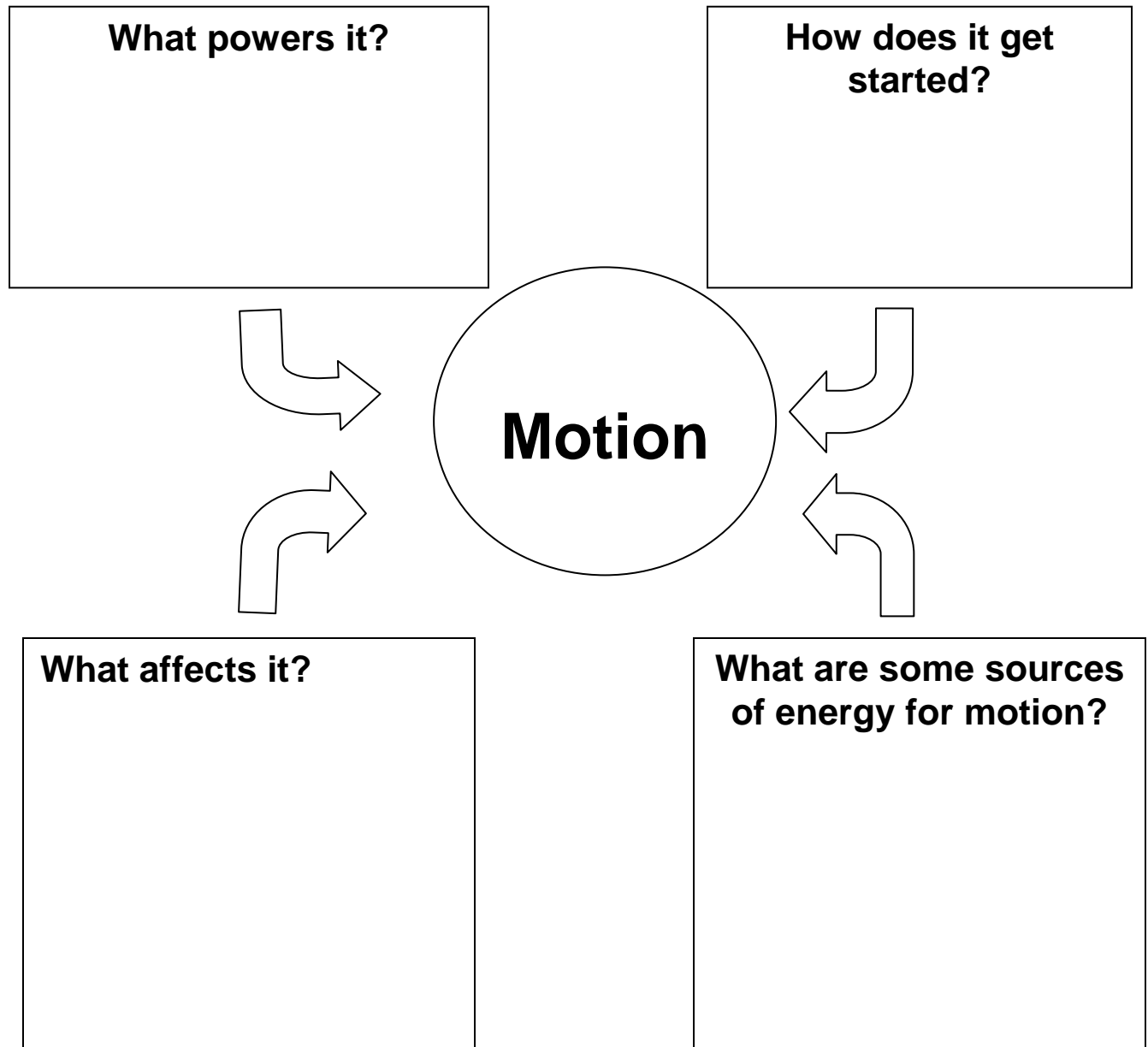
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### Motion Power

Fill in the squares with words that tell about the term "motion."  
You may use words from the Word Bank below.

Checkpoint



Word bank:

gravity	push	pull	energy	friction
sun	air	oil	food	transfer of energy

# Marble-ous motion



### Directions:

There are three diagrams on these pages. Each diagram shows a marble game. The marbles are inside a circle.

Two of the marbles have the letters **A** or **B** on them.

Use the diagrams and your knowledge of motion to help you to answer the questions.

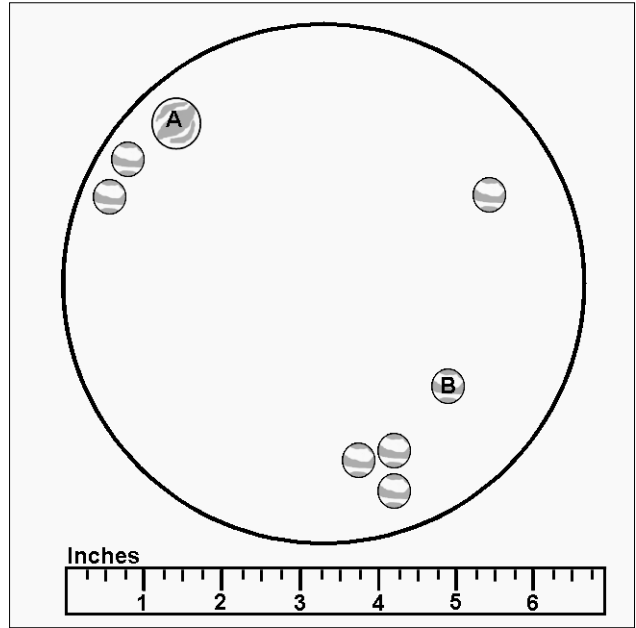


Diagram 1

Fill in the blank with a word that would finish the sentence or answers the question.

1. Marble A will not move unless there is a \_\_\_\_\_ .
2. If Marble A rolls towards Marble B it will have energy of \_\_\_\_\_ .
3. A source of energy to roll Marble A could be \_\_\_\_\_ .
4. Draw an arrow on the Diagram 1 to show the direction Marble A would move to hit Marble B.

In order to describe where something is you have to tell its location in relation to some other object. For example, you may say that your desk is near the door. You may state that it is in the row near the window.

5. Write a sentence to describe where Marble A is in the circle.

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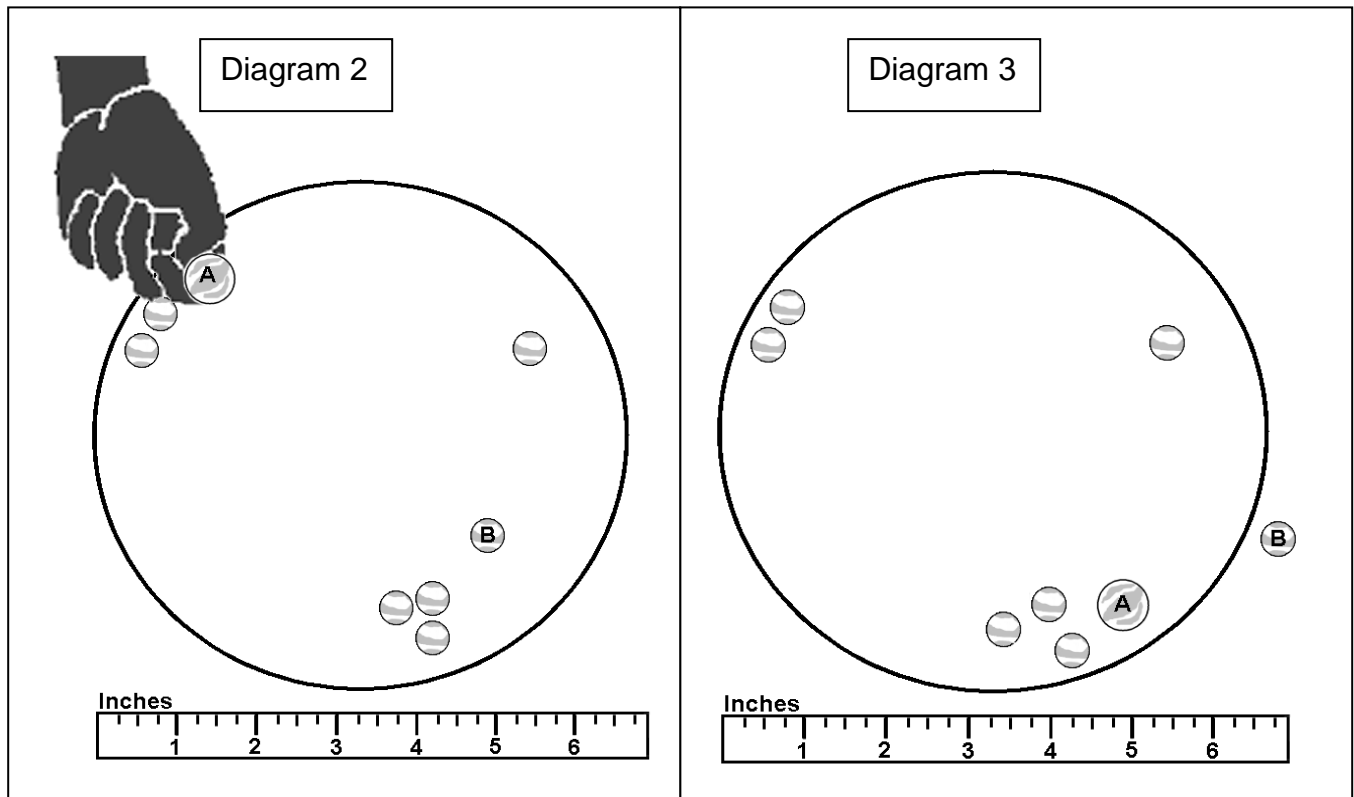
6. Write a sentence to describe where Marble B is in the circle.

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**Marbel-ous motion (page 2)**



7. In Diagram 2 the hand will use a \_\_\_\_\_ force to move Marble A.
8. In Diagram 3 Marble B has been forced to move by \_\_\_\_\_.
9. The energy needed for Marble A to move came from \_\_\_\_\_.
10. The energy needed for Marble B to move came from \_\_\_\_\_.

Use your observations of Diagram 2 and Diagram 3 to answer each question.

11. Look at Diagram 2 and 3. How do you know that Marble A has moved?

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12. How do you know that the three marbles near Marble A have moved?

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## Design a Marble

You have been using marbles from the Science Kit. Here is your chance to design your own marble! What can a marble be made of? What shape can it have? What color or colors can it have? Can you describe its texture or any designs on it?

Use the lines at the bottom of this page to write about the marble that you designed.

My marble's  
properties:

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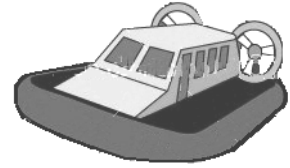
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**Air Powered Racer Results Final Report Sheet**



Sketch your racer. Label the parts in your design.

1. Why do you think your design will make it move better?

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2. How did your racer do? Describe where your racer started and where it stopped.

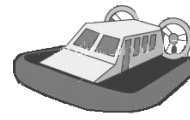
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Air Powered Racer Results Final Report Sheet



3. If you could start over with your design, what would you do the same or differently?

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4. On a piece of paper, sketch a picture of your racer showing it racing.

Add the following to your picture:

- motion: Draw a fat arrow to show the direction of motion of the racer.
- energy: Draw a box in your picture. Write in the box the form of energy the racer has.
- force: Next to the motion arrow write the type of force (push or pull) that is used.
- gravity: Draw an arrow to show the direction of the force of gravity on the racer. Color the arrow blue.

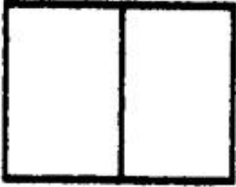
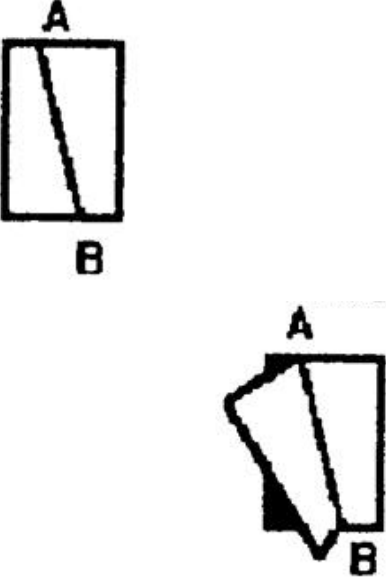
## Kite Building

Your job is to build a basic kite and test it to see how well it flies. After you test the kite, your task is to change the design in some way. This change can be changing the diamond shape to a different shape. (You may use a different geometric shape or an animal shape). It can be changing a part of the kite. You decide! Then you will build the new kite and test it to see how well it flies.

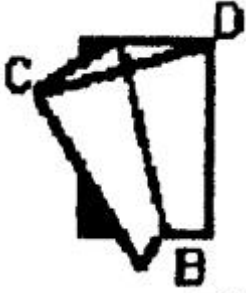
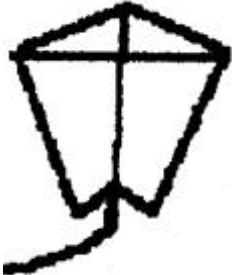

### Material list:

- 1 sheet of 8 1/2" x 11" copy paper
- an 8" stick
- a 5-foot piece of crepe paper streamer (A plastic bag cut in a 1" wide spiral all around will also make a great tail.)
- 1 roll 1/2" wide masking tape or any type of plastic tape
- 10 foot long piece of string
- a piece of 1" x 3" cardboard on which to wind the string
- Scissors
- Hole punch (optional)

### Directions:

<p>1. Fold a sheet of 8 1/2" x 11" paper in half (hamburger style).</p>	
<p>2. Fold again along the diagonal line A.</p> <p>To help you do this, measure from the fold at the very top of the page and draw a dot at 3/4".</p> <p>Draw a dot at 2 1/2" in on the bottom edge.</p> <p>Lay a ruler across the paper to connect the dots and draw a line. This is where the diagonal fold will go. You can keep the ruler along the line to help you fold the paper back.</p> <p>3. Fold back one side forming the kite shape. Place tape firmly along fold line AB.</p>	

**Kite Building**

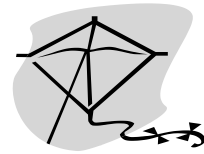
<p><b>4.</b> Place the stick from point C to D and tape it down firmly. The kite will not be flat after you do this.</p>	
<p><b>5.</b> Tape the streamer to the bottom of the kite at B.</p> <p><b>6.</b> Flip kite over onto its back and fold the front flap back and forth until it stands straight up. (Otherwise it acts like a rudder and the kite spins around in circles.)</p>	
<p><b>7.</b> Punch a hole in the front flap about 3 inches down from the top point A.</p> <p><b>8.</b> Tie one end of the string to the hole and wind the other end onto the cardboard string winder.</p>	

For over 15 years the Big Wind Kite Factory has been giving kite building classes for the children on the island of Molokai in Hawaii. These are the instructions to get kids making their own kites and flying them in 20 minutes  
<http://www.molokai.com/kites/20kidskites.html>



Acme Company

**Air Powered Flyer Results Report Sheet**



1. Describe how your basic kite flew.

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2. What changes will you make to the basic design?

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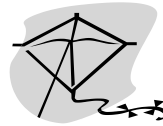
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Sketch your kite. Label the parts that you changed or added to the design.

Air Powered Flyer Results Report Sheet



3. How did your new kite design do? Tell if the kite flew any differently than the basic kite.

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4. What would you do the same or differently if you were able to do your design again?

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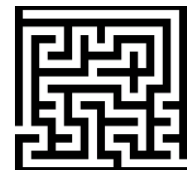
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5. On a piece of paper, sketch a picture of your kite showing it flying.

Add the following to your picture:

- motion: Draw a fat arrow to show the direction of motion of the flyer.
- energy: Draw a box in your picture. Write in the box the form of energy the flyer has.
- force: Next to the motion arrow write the type of force (push or pull) that is used.
- gravity: Draw an arrow to show the direction of the force of gravity on the flyer. Color the arrow blue.

### Maze Game Report



You should have a piece of paper with your plan for your maze. Attach that plan to this report sheet.

1. What are two things that you had to think about in planning your maze?

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2. What materials did you decide to use in your maze?

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3. Do you like your design? What would you do differently if you were to make a new maze?

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4. There are forces involved in your game. Tell where each of these forces are found in the game.

friction:

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gravity:

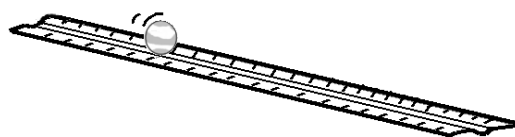
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5. Matter and energy play a part in your game. What form of

energy is used in the game? \_\_\_\_\_ What

object (matter) had this energy during the game? \_\_\_\_\_

## Marble Derby Report



1. In this activity I planned a simple system. The three basic parts of my simple system are:

\_\_\_\_\_

2. My group built one Marble Derby system using a pre-planned design. We set up the system and used the stopwatch to time the energy flow. The energy moved from one object to the next. This is the sequence of the energy flow:

hand -> \_\_\_\_\_ -> \_\_\_\_\_ -> \_\_\_\_\_

The number of energy transfers was \_\_\_\_\_.

The actual time from start to finish was \_\_\_\_\_.

3. My partner and I planned a Marble Derby system to share with our whole group. While we were drawing our plan we thought that the most important part of the planning was

\_\_\_\_\_

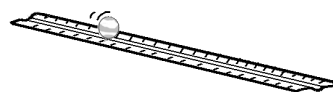
4. My whole group got together and shared our ideas. We decided on a design. Next, we tested our design and made any changes.

I am going to write out the sequence of the objects in our design. In the sequence I will write a number in front an object to tell how many there are.

For example, for the pre-planned design the sequence would be:

1 hand -> 1 marble -> 3 dominos -> 1 marble

My Sequence of Motion Diagram



Start

Finish

5. We ran our Marble Derby and earned these points.

Number of energy transfers: \_\_\_\_\_

Number of seconds from start to finish: \_\_\_\_\_

***What I have learned. What I can do.*** (Fill in or do each of the following items.)

A. I know that \_\_\_\_\_ is being transferred or passed on from one moving object to the next.

B. The form of energy that the marbles have is \_\_\_\_\_

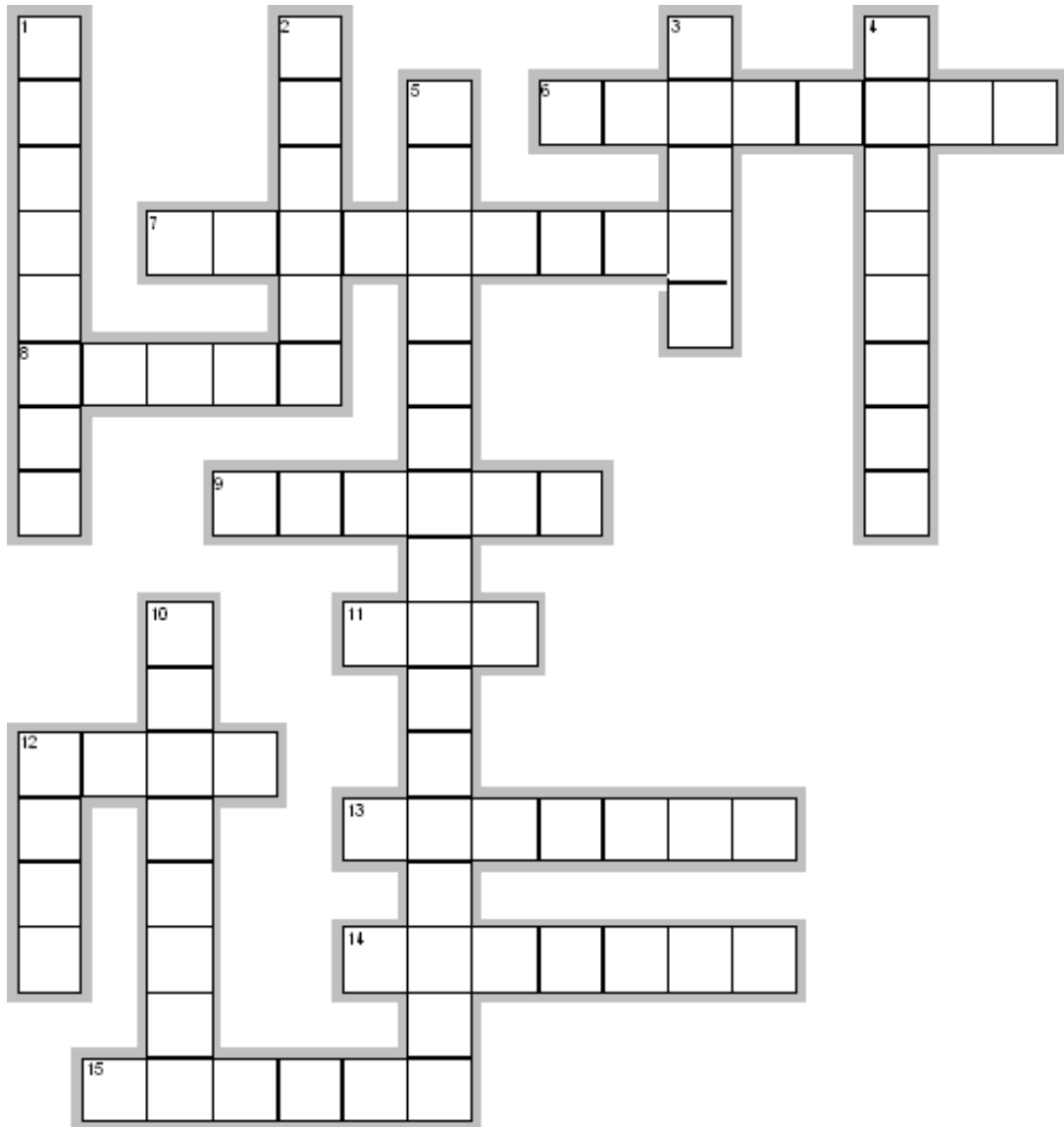
C. I can use descriptive words to describe the position of one of the rulers in the derby.

\_\_\_\_\_

D. On the sequence of motion diagram I can draw circles around the objects that are moved by a pushing force. I can draw squares around the objects that are moved by a pulling force.

E. I know that the places in my derby plan where friction is slowing the marble's motion are \_\_\_\_\_

**MOTION Unit Crossword Puzzle**



Created with EclipseCrossword — [www.eclipsescrossword.com](http://www.eclipsescrossword.com)

**Across**

**Down**

<ul style="list-style-type: none"> <li>6. an observable characteristic</li> <li>7. a line along which an object moves</li> <li>8. a push or a pull</li> <li>9. an action that is a change in the position of an object</li> <li>11. the shooter marble</li> <li>12. a force against an object</li> <li>13. a resistance to change</li> <li>14. the force that pulls objects towards the center of the Earth</li> <li>15. the ability to do work</li> </ul>	<ul style="list-style-type: none"> <li>1. to pass something on from one object to another</li> <li>2. the beginning or starting point</li> <li>3. the shape of a marble</li> <li>4. a rubbing force between two objects</li> <li>5. the ability to do work by using motion</li> <li>10. a certain location</li> <li>12. a force on an object that moves away from an object</li> </ul>
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Part 1- Vocabulary: Match the word and its definition by writing the letter in front of the word.

Letter	Word	Definition
	transfer	A. a push or a pull
	friction	B. resist change
	position	C. to pass something on
	pull	D. a rubbing force between objects
	property	E. a certain location
	force	F. a force against an object
	inertia	G. an observable characteristic
	gravity	H. the force that pulls objects to the Earth
	energy	I. the ability to do work
	push	J. a force on an object that moves away from the object

Part 2- Complete the statement using the science concept.

Transfer of energy

1. In the game of bowling, energy is transferred to the pins when

\_\_\_\_\_

2. When you ride a bicycle energy is transferred to the wheels when

\_\_\_\_\_

Friction

3. By spreading sand on icy roads, highway crews are trying to make the friction

\_\_\_\_\_

4. I like to slide on smooth floors because the friction is

\_\_\_\_\_

PART 3- Base your answers to questions A - G on the story and your knowledge of science.

It was almost the end of the basketball game. The two teams were playing hard to get ahead of the other. The Hawks were in the lead by 2 points.

Then the Eagles got the ball and Joan was dribbling the ball down the court. Joan saw that Kim was too far away. She heard the steps of a player behind her. Joan saw that it was #5 of the Hawks. Joan thought, "She's too slow to be a good player. I can get through her." Joan made her move and quickly passed the ball to Mary. Mary shot the ball at the basket. It hit the rim and flew away from the basket. Running and leaping, Kristen reached for the ball and brought it towards her. In next moment she jumped again, reached out with the ball and flicked it over the rim into the basket! The ball swished through the basket and fell to the floor. With a roar the crowd jumps to its feet. The game was tied!

A. Give 2 examples of a **pushing force** in the story.

\_\_\_\_\_

B. Give one example of a **pulling force** from the story.

\_\_\_\_\_

C. Where is the ball getting its **energy** from when Joan passed it to Mary?

\_\_\_\_\_

D. List 4 objects that have **energy of motion** in the story.

\_\_\_\_\_

\_\_\_\_\_

E. What is the **force** that caused the ball to "fall to the floor" after it went through the basket?

\_\_\_\_\_

F. Write down an **observation** that is made by someone in the story.

\_\_\_\_\_

G. Write down an **opinion** given in the story.

\_\_\_\_\_



## PART 4- Multiple Choice

1. What type of energy does a ball have as it moves through the air?
  - A. light energy
  - B. mechanical energy
  - C. heat energy
  - D. gravity energy
  
2. Third graders are planning a roller skating race. Which surface would be the best for the race?
  - A. gravel
  - B. blacktop
  - C. sand
  - D. grass
  
3. Which is NOT an example of energy of motion?
  - A. a wheel turning
  - B. a bulb lighting
  - C. a hand throwing
  - D. a rock rolling
  
4. Which is an example of people using energy of motion?
  - A. a rocket blasting off
  - B. a pot heating
  - C. a person growing
  - D. a computer
  
5. A ball is tossed in the air and comes back down. The ball comes back down because of
  - A. gravity
  - B. erosion
  - C. friction
  - D. magnetism
  
6. You need to tell a friend where your house is. The best information you can give them is
  - A. your county and state
  - B. your last name
  - C. your house number
  - D. your street and house number
  
7. Which is NOT an observation of the properties of your house?
  - A. it is pretty
  - B. it is small
  - C. it is green
  - D. it has many windows