



# ASCEND BREAKWORK PACKET FOR 7<sup>TH</sup> GRADE

Dear Families,

In this packet, you will find reading, math, and science activities for your scholar to complete over the break. These activities are meant to challenge your scholar's thinking, while also being fun and engaging. Please feel free to complete this work along with your scholar, asking questions and taking part in conversation as you go. This will make their experience even richer!

Your scholar will be better off if they complete their activities over time throughout the break—switching back and forth between subjects—than if they try cramming them into the last few days.

Thank you for supporting your scholar's learning. Together, we can push them to new heights!

Ascend Public Charter Schools

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# 7<sup>TH</sup> GRADE MATH

To help you prepare for school after the break, a break work math packet is attached. This packet includes problem sets that you should know prior to going back to school. You should NOT use calculators.

Reminder - Practicing multiplication (up to 12) and division facts is VERY important!

## **HELPFUL WEBSITES:**

<http://www.khanacademy.org/>

<http://www.aplusmath.com>

<http://funbrain.com>

<http://aaamath.com>

<http://math.com>

## **HELPFUL APP:**



**"Virtual Nerd Mobile"**

**Requirements:** iOS 6.0 or later; compatible with iPhone, iPad, and iPod Touch

**Features:** Virtual Nerd's on-screen instructors provide clear and approachable explanations; students can mark "favorite" videos so that they can instantly return to them in the future.

**Price:** Free

**Problem Set One: Fractions and Decimals**Order the following sets of numbers on the number line from **least to greatest**.

<p>1) <math>\frac{4}{5}, -\frac{2}{3}, -\frac{2}{6}, -0.75</math></p> 	<p>2) <math>\frac{3}{8}, \frac{2}{9}, -0.6, -\frac{3}{8}</math></p> 
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Evaluate each of the following. Show your work.

<p>3) <math>9.6 + 8\frac{2}{5}</math></p>	<p>4) <math>(5.9)(1.102)</math></p>
<p>5) <math>7\frac{5}{6} - 1\frac{4}{9}</math></p>	<p>6) <math>161.2 \div 3.1</math></p>
<p>7) <math>\frac{13}{20} \div \frac{8}{10}</math></p>	<p>8) <math>2\frac{1}{6} \times \frac{4}{5}</math></p>

$$9) 1\frac{1}{4} + 1.35 + 2.56 + 2\frac{7}{10}$$

10) One cupcake weighs  $3\frac{1}{2}$  ounces. How many cupcakes are there in a 28-ounce package?

11) Which one of the following fractions is not equivalent to the others?

a.  $\frac{12}{15}$

b.  $\frac{20}{25}$

c.  $\frac{25}{30}$

d.  $\frac{28}{35}$

Show how you found your answer.

12) Gina is making a bookcase and has  $92\frac{5}{8}$  inches of wood. If she uses  $61\frac{3}{4}$  inches of wood for the top and bottom, how much wood does she have left for the sides?

13) Stephanie is making lasagna for a party. The recipe uses  $1\frac{1}{2}$  teaspoons of basil,  $\frac{2}{4}$  teaspoons of salt,  $\frac{1}{8}$  teaspoons of pepper and 4 teaspoons of parsley. If she needs to make 1.5 times the recipe, how many teaspoons will she use of each ingredient? How many teaspoons will she use in total (when she combines all of the ingredients)? Show all of your work.

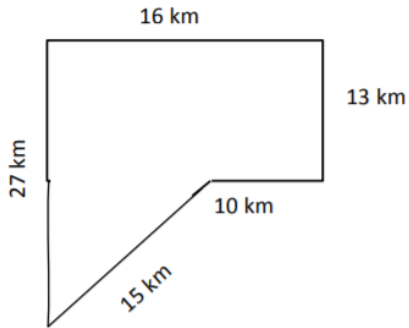
**Problem Set Two: Geometry**

14) If the perimeter of Milo's rectangular backyard is 16 feet. What are the possible whole number dimensions of the length and the width of the yard?

15) If the area of Jodi's deck is 36 square feet. What are the possible whole number dimensions of her deck?

16) You want to make a rectangular prism out of cardboard, without overlapping cardboard. It has the length of 3 feet, the width of 1 foot, and the height of 2 feet. How much cardboard would you need to buy? Show all your work.

17) What is the area of the irregular polygon below (not to scale)?



**For questions 18 and 19 - determine whether each statement is always, sometimes, or never true. Explain or give a counter example to support your answer.**

18) Both x and y coordinates of a point in quadrant 1 are negative. \_\_\_\_\_

19) The x coordinate of a point that lies on the x-axis is negative. \_\_\_\_\_

20) A box of cereal has the dimensions of 8 inches, 3 inches and 12 inches. Find the volume of the box. Show all your work.



**Problem Set Three: Proportional Reasoning**

21) If you can buy 8 gallons of gas for \$26.50, what is the unit rate?

22) Verizon has to install cable along a road that is  $1\frac{1}{2}$  miles long. It takes the crew 1 day to lay  $\frac{1}{4}$  of a mile of cable. How many days will the installation take?

23) Eli wants to buy a video game that costs \$35. He has a 25% coupon. How much is the discount? What will he pay for the video game?

24) The school is having a bake sale. It costs \$6 to make a cake. The school wants to make a 25% profit on each cake. How much should the school charge for each cake?

25) Sixteen of 80 dogs in a rescue kennel are puppies. What percent of the dogs in the kennel are puppies?

**Problem Set Four: Algebra and Negative Numbers****Solve.**

26) $56 = 7p$	27) $56 = \frac{h}{9}$	28) $\frac{k}{5} - 10 = 3$	29) $3t + 5 = 2$
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**Write an algebraic expression for the following:**

30) Three less than four times a number \_\_\_\_\_

31) Eight less than the quotient of a number \_\_\_\_\_

32) Twelve more than the product of 12 and y \_\_\_\_\_

33) Janie and her friends played a question and answer video game. Their scores at the end of the game were 14, -15, 8, -16, 3, 0, 12, 10. Find the median score of the game.

34) The average temperature of Saturn is  $-218^{\circ}\text{F}$  while the average temperature of Jupiter is  $-162^{\circ}\text{F}$ . Which planet has the lower average temperature? Explain your reasoning.

35) Find all values of  $x$  that make the statement  $|x| = 7$  true. Explain your reasoning.

Problem Set Five: Decimals

1. 0.0084

2. 0.032

3. 0.4500

4. 0.001

Solve. Write your answer as an improper fraction in simplified form.

5.  $110 \div 12$

6.  $252 \div 100$

7.  $12 \div 5$

8.  $82 \div 6$

 $\div$ 

9.  $217 \div 9$

10.  $56 \div 16$

11.  $99 \div 66$

12.  $120 \div 25$

13.  $360 \div 84$

14.  $300 \div 35$

15.  $144 \div 64$

16.  $500 \div 85$

Problem Set Six: Fractions

1.  $\frac{1}{3} \cdot \frac{2}{5}$

2.  $\frac{35}{2} \cdot \frac{1}{15}$

3.  $1\frac{7}{8} \cdot 3$

4.  $\frac{2}{3} \cdot \frac{1}{10} \cdot \frac{3}{4} \cdot \frac{5}{6}$

5.  $\frac{1}{3} \div \frac{2}{5}$

6.  $\frac{35}{6} \div \frac{9}{10}$

7.  $10\frac{2}{3} \div 1\frac{1}{2}$

8.  $\frac{11}{2} \cdot \frac{1}{2} \div \frac{4}{3}$

1.  $\frac{7}{10} + \frac{1}{2}$

2.  $3\frac{1}{8} + 2\frac{1}{4}$

3.  $\frac{35}{11} + \frac{7}{22}$

4.  $\frac{1}{3} + \frac{2}{5} + \frac{3}{7}$

5.  $\frac{3}{5} - \frac{1}{3}$

6.  $6\frac{3}{5} - 1\frac{1}{2}$

7.  $\frac{22}{7} - \frac{5}{21}$

8.  $\frac{11}{5} - 1\frac{1}{4}$

Problem Set Seven: Percents

1. 1.1000

2. 0.005

3. 0.775

4. 20.50

Write each fraction or mixed number as a percent.

5.  $2\frac{1}{2}$

6.  $\frac{3}{25}$

7.  $1\frac{3}{4}$

8.  $\frac{3}{8}$

Write each percent as a decimal.

9. 52%

10. 31.5%

11.  $25\frac{1}{4}\%$

12.  $\frac{1}{2}\%$

Write each percent as a fraction.

13. 85%

14. 1%

15. 62.5%

16. 320%

Problem Set Eight: Statistics

1. 220, 310, 300, 340, 250

2. 13.1, 12.5, 13.0, 13.3, 13.4

3. 3, 2, 4, 3, 7, 9, 2

4. 0.007, 0.006, 0.003, 0.010, 0.002, 0.008

5. The mean of five numbers is 12. Four of the numbers are 6, 10, 15, and 20. What is the fifth?

## Mixed Review

- Annie and Bernie built a maze for their hamsters. Annie's hamster completed the maze 7 seconds less than twice the time it took Bernie's hamster to complete the maze. If Bernie's hamster completed the maze in  $b$  seconds, which expression represents the time, in seconds, it took Annie's hamster to complete the maze?  
A.  $7 - 2b$   
B.  $2b - 7$   
C.  $2b + 7$   
D.  $\frac{2b}{7}$
- A jeweler makes bracelets from silver chain. She made 7 bracelets that were each  $5\frac{3}{4}$  inches long. She also made 3 bracelets that were each  $6\frac{1}{2}$  inches long. What is the total length, in inches, of silver chain that the jeweler used to make all 10 bracelets?  
F.  $22\frac{1}{4}$   
G. 53  
H.  $59\frac{3}{4}$   
I.  $122\frac{1}{2}$
- A concession stand at a baseball field pays \$0.05 for each packet of mustard. How much will the concession stand pay for 7,000 packets of mustard?
- On his whiteboard, Jamal correctly wrote a mixed number in lowest terms that was equivalent to 3.35. What number did Jamal write on his whiteboard?  
A.  $3\frac{3}{5}$   
B. 53  
C.  $3\frac{7}{20}$   
D.  $3\frac{35}{100}$



5. Which of the following is NOT equivalent to  $\frac{8}{10}$ ?

F.  $\frac{80}{100}$

H. 0.8

G. 8%

I. 80%

6. The steps Laura used to solve an equation are shown below. What should Laura change in order to solve the equation correctly?

$60 = 6x - 34$ $\frac{60}{6} = \frac{6x}{6} - 34$ $10 = x - 34$ $10 + 34 = x - 34 + 34$ $44 = x$
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- A. Subtract 60 from both sides before dividing by 6.
- B. Add 34 to both sides before dividing by 6.
- C. Subtract 34 from both sides before dividing by 6.
- D. Rewrite the equation as  $6x = 60 - 34$ .
7. Four customers at a deli each bought a different item. Each item had a different price per pound. The amount of the item each person bought and the total amount each person paid are shown below.

Francesca: 0.7 pound for \$11.19

Gail:  $\frac{1}{2}$  pound for \$12.00

Henry: 0.62 pound for \$10.75

Isaac:  $1\frac{1}{4}$  pounds for \$20.63

Which customer bought the item that had the lowest price per pound?

F. Francesca

H. Henry

G. Gail

I. Isaac

8. Simone has \$40 to buy baseballs for her team's practice. Each baseball costs \$3. Which inequality represents this situation?

A.  $3b < 40$                       C.  $3b < 39$   
B.  $3b > 40$                       D.  $3b > 39$

9. Which inequality represents the solution to the inequality below?

$$26 < 6a$$

F.  $a < 20$                       H.  $a < 4\frac{1}{3}$   
G.  $a > 20$                       I.  $a > 4\frac{1}{3}$

10. Four squares measuring 5 centimeters on each side are combined to create two different figures, as shown below.

Figure Y

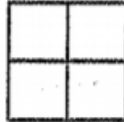
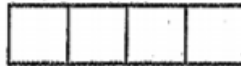


Figure Z

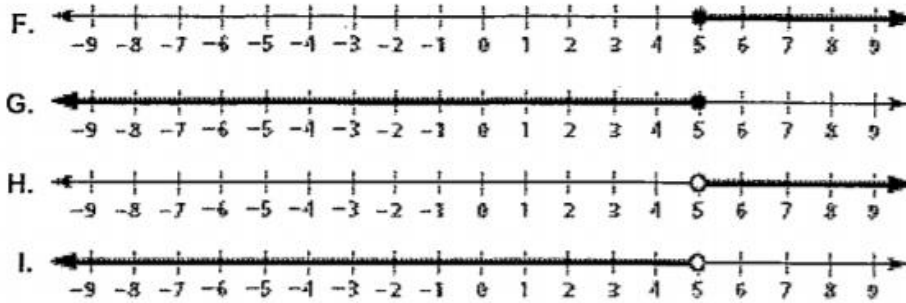


Which statement correctly compares the perimeters of Figure Y and Figure Z?

- A. The perimeter of Figure Y is equal to the perimeter of Figure Z.  
B. The perimeter of Figure Y is equal to 2 times the perimeter of Figure Z.  
C. The perimeter of Figure Y is 2 centimeters less than the perimeter of Figure Z.  
D. The perimeter of Figure Y is 10 centimeters less than the perimeter of Figure Z.

11. Which graph represents the inequality shown below?

$$x > 5$$



12. **SHORT RESPONSE** For each expression, explain how to use the properties of addition and multiplication to simplify the expression with the easiest computation possible. Show your work and name the properties you used.

*Part A*  $47 \times 38 + 47 \times 62$

*Part B*  $752 + (467 + 248)$

13. What is the missing number in the input-output table below?

Input	3	5	?	17
Output	16	22	31	58

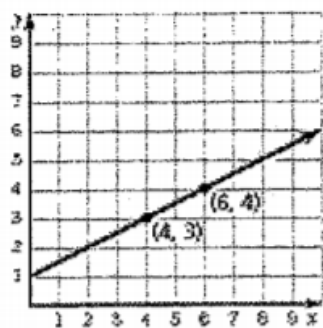
A. 8

C. 11

B. 9

D. 14

14. Which equation represents the line in the graph below?



F.  $y = 4x - 3$

H.  $y = \frac{1}{2}x + 1$

G.  $y = 2x + 1$

I.  $y = \frac{1}{2}x - 1$

15. **EXTENDED RESPONSE** The manager of an appliance store has 6 washing machines for sale. The prices of the six machines are shown in the box below.

\$450, \$400, \$450, \$599, \$675, \$500

The manager decides to also sell a seventh washing machine that has many additional features. The price of this machine is **greater than** \$1000. Describe how each of the following measures will change when the price of the seventh washing machine is included with the prices of the 6 original machines.

*Part A* the **mean**

Mean \_\_\_\_\_

*Part B* the **mode**

Mode \_\_\_\_\_

*Part C* the **range**

Range \_\_\_\_\_

*Part D* the **median**

Median \_\_\_\_\_

# 7<sup>TH</sup> GRADE SCIENCE

In seventh grade you have been learning all about the Hudson River. Use the break to complete experiments and readings that will help you further understand seventh grade science.

## Experiments and readings:

- Everyday Darwin: Create a Nature Journal
- Read about rivers and watersheds
- Build a watershed

## Science Books

Look for these great books about science at your local library.

Titles	Author	Topic
Trailblazers: 33 Women In Science Who Changed The World	Rachel Swaby	Learn the untold story of 33 different women in science.
Extreme Scientists: Exploring Nature's Mysteries from Perilous Places	Donna M. Jackson	Discover the world of extreme scientists — daredevils who explore some of Earth's most intense conditions to help us better understand the way our planet works.
How To Build Robots	Louise Derrington	Learn how to build robots in this easy-to-use book.

## Everyday Darwin: Create a Nature Journal

Charles Darwin is best known for discovering how species evolve and adapt, and you can follow in his footsteps. Create a journal all about organisms in your community.

By creating an interactive observation notebook you will get a chance to see the world around you from a different point of view.

Materials needed:

- Access to the library or internet
- Notebook
- Pen or pencil
- Crayons or colored pencils

Steps:

### 1. Do Research

- Visit your local library or use the internet to learn about organisms in your neighborhood.
- Choose at least two organisms to study.
- Record your research in your notebook.

### 2. Create an observation chart.

- In your notebook, set up a chart for observing your species in nature. Create one chart for each species you have chosen.
- Create five columns, and label the first column of your chart with the heading "Date and Time." Label the remaining columns with these headings: "Location," "Weather Conditions," "Species Sighted," and "Observations."
- Make sure to leave extra room at the bottom for any additional notes.



3. Ask questions. Write 2-3 questions you want to answer about the organisms.
4. Work with an adult to plan your observations. Always make sure an adult knows where you are and stay safe!
5. Observe. Make sure you take detailed notes.
6. Compile your notes and look for patterns. Analyze the data.
7. Try writing a scientific explanation to answer your questions.

You can work on this project all of break! There is no need to rush. Have fun and explore nature.



# Bodies of Water: Rivers



The Amazon is the world's largest river by volume. It flows through the Amazon rain forest. Photo from: Neil Palmer, International Center for Tropical Agriculture

A river is a large natural stream of water that flows over land. Even though rivers hold only a tiny fraction of Earth's total water, they have always been essential to human civilization. Rivers carry freshwater to people, plants and animals all across Earth. They provide people with a method of transport and water power. They also shape the land by carving out valleys and canyons.

## **How Rivers Flow**

A river begins as a tiny trickle of water on high ground. The water may come from rainfall, from melting snow or ice or from underground through a spring. As the trickle runs downhill, it combines with other trickles. It may be called a stream, a brook or a creek.

Eventually the creek grows into a river. In its upper course the river flows rapidly. It cuts through the land and picks up soil and gravel. The moving water and the material it carries wear away even more rock and soil. Over thousands or millions of years, the river creates

canyons and deep valleys in this way. The Grand Canyon, formed by the Colorado River in the United States, and the great gorge of the Zambezi below Victoria Falls in Africa, show the changes a river can make in Earth's surface.



In its middle course the river flows down gentler slopes. It gets larger and slower. Soil, gravel and sand begin to sink to the bottom. Some of this material builds up to form sandbars and islands.

In its lower course the river flows even more slowly. It drops still more solid material. Some material is carried all the way to the mouth — the place where the river enters the sea. This material may build up to form a piece of land called a delta.

## **River Systems**

A river receives water from the smaller streams that flow into it. These streams are called tributaries. A river and its tributaries make up a river system. The area that a river system covers is called a basin. Some rivers have very large basins while others of equal length drain much smaller basins. The world's two longest rivers, the Amazon and the Nile, are about the same length, but the basin of the Amazon is more than twice as large.



## Rivers And Human Life

Rivers have always been of great use to humans. The earliest civilizations, including those of Mesopotamia and Egypt in the Middle East and the Indus Valley in what is now Pakistan, developed near rivers. The rivers provided early humans with water to drink and fish to eat. When people learned to build and use boats, rivers supplied a cheap and easy way to travel. Floodplains provided fertile soil for crops, and the system called irrigation allowed people to use rivers to water their fields.

People still depend on rivers for much of their water supply. Cities need huge amounts of water every day for use in homes and factories. Large riverboats called barges still carry grain, coal and minerals. In many places rivers are used to produce electric power. Hydroelectric dams, such as the Hoover Dam on the Colorado River, harness the swift flow of rivers to create great amounts of electricity. Dams are also used to control the flow of rivers. They can prevent frequent flooding, which causes problems for people who live near rivers.



Some human activities are harmful to rivers. Large factories built alongside rivers use enormous amounts of water for cooling and other purposes. Then they return the water to the river at overheated temperatures. The unnaturally hot water disturbs the ecology of the river and kills fish. Industries also dump harmful chemical waste into rivers. Cities near rivers contribute to the problem by releasing their wastes into the water. Another source of river pollution is the use of chemical fertilizers or pesticides (insect-killing substances) on surrounding land. These chemicals get into the groundwater and then can enter a river.

Pollution does not just affect the creatures that live in the water. When people eat fish taken from polluted streams, the pollution passes into their bodies and can cause cancer or other health problems.

# Mississippi Watershed

## MISSISSIPPI WATERSHED



The Mississippi watershed is the largest in North America. It spans about 3.2 million square kilometers (1.2 million sq. mi.).

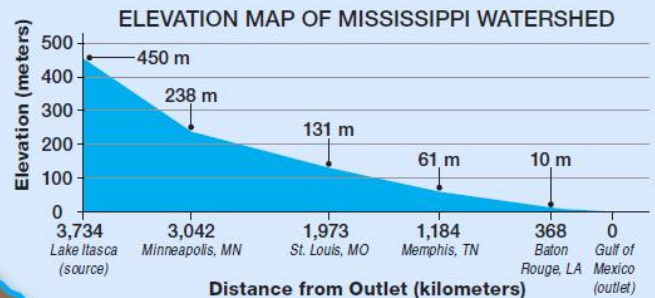
The Mississippi River winds through rural and urban areas as it flows south to the Gulf of Mexico.



## America's Mighty Watershed

The Mississippi River begins as just a trickle in Minnesota. It starts out small, but it gets very wide as it flows south. It is also very long. In fact, the Mississippi River is the fourth-longest river on Earth. Many smaller rivers and streams flow into this mighty river.

All of this surface water and the land it flows over, along with groundwater, make up the Mississippi watershed. It covers much of the central United States. Water from as far away as Montana and New York flows into the watershed. The watershed has higher land along its edges. The Allegheny Mountains lie to the east. The tall Rocky Mountains are to the west. Rivers and streams flow down these mountains. They connect to larger and larger rivers. The water ends up in the Mississippi River. From there, the water flows downhill into the river's main outlet, the Gulf of Mexico.





## People and the River

Millions of people live and work near the Mississippi River. Farmers grow corn, wheat, and other foods. They raise pigs, chickens, and cows. Industries make steel, gravel, and paper. All of these activities can pollute the river. Chemicals and animal waste from farms get into the river. Factories pollute the water as well. When it rains in nearby cities, pollution runs into the river.

Rain and snow add fresh water to the rivers and the groundwater. These natural sources of water refill the watershed. However, this fresh water isn't enough to keep it clean. The quality of the water is affected by the environment it passes through. When pollution ends up in the water, fish and other animals may die. The water may even be unsafe to drink. But people are working hard to clean up the water.

**Do You Know?**  
Chemicals that get in the water can cause a rapid growth of algae. The algae use up oxygen in the water, creating a *dead zone* where fish and other animals cannot live.

**wowser!**  
The Mississippi River is home to at least 260 species of fish.







**catfish**

**sturgeon**

**bluegill**

**Math Moment!**  
About 4 out of every 10 ears of corn grown in the world come from the Mississippi watershed. If 2 million ears of corn are grown around the world, about how many of them are from the Mississippi watershed?

Products worth billions of dollars are shipped down the Mississippi River every year.

Analysis questions:

- What are the differences between a river and a watershed?
- How do humans interact with rivers? Consider both positive and negative impacts.
- What rivers are near you in New York?
- How do you think you interact with rivers on a daily basis? Yearly basis?

## Build a Watershed

Work with a friend or family to build a watershed model. Take pictures or draw sketches to document your progress.

### Gather these Materials



- Large aluminum roasting pan or paint tray
- 6 to 10 pages of newspaper
- Masking Tape
- Sheet of white plastic, slightly larger than the pan (a trash compactor bag cut into single sheet works well)
- Spray bottle
- Blue food coloring
- Absorbent cloth or paper towels
- 2 different colors of permanent markers
- Blocks of wood or a notebook to lift one end of the tray

### Steps

1. Crumble several pieces of newspaper into balls and rolls of different sizes and shapes. Place them into your roasting pan or paint tray. Use tape to keep them in place.
2. Lay your plastic bag out flat on a table or the floor and smooth out the wrinkles.

3. Place one end of the pan on wood blocks or a notebook, then cover the entire pan and its contents with the plastic. Gently press the plastic down around the crumpled paper balls. Leave the excess plastic around the outside of the box to protect the area from getting wet.



4. The plastic cover represents Earth's surface. The lumps represent mountains and hills, and the areas between them represent valleys. Use your imagination to visualize your model as a portion of Earth's surface.
5. Fill your spray bottle with water and add a few drops of blue food coloring to make the water easy to see. Spray just enough rain over your model to see how the water interacts with your model landscape.

6. Look for these features in your model.

- Streams or Rivers—linear flows of water running downhill;
- Ponds or Lakes—areas where water pools up in low areas; and
- Drainage divides—imaginary lines along which the "rain" goes to one side or another.



7. Use your cloth or paper towels to absorb the water from your model. Adjust the paper balls and plastic to make your landscape as realistic as you can, then spray it with model rain again.
  
8. When you think you can predict the locations of streams and drainage divides on a model landscape, wipe your plastic dry and set up the model again. Use markers to draw your predictions for the locations of streams and divides directly on the plastic.

Analyze:

- How does this model help demonstrate a watershed?
- Why do you think watersheds are helpful to people or the environment? Use the model as evidence for your argument