

Math, Science, and Literature: Making the Connection

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Middle Tennessee Mathematics Teachers
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Brentwood Middle School
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Science and Mathematics Connections to Literature

1. Read pages 8 and 9 of *Counting on Frank* by Rod Clement.

ISBN-10: 039570393X

ISBN-13: 978-0395703939

- Ask students to estimate how big the humpback whale must be using what they know about the dimensions of a house.
- Ask students to do research to determine how close their estimation was.

2. Read pages 18 and 19 of *Counting on Frank*.

Give students some frozen peas, canned peas, or some uncooked peas.

- Ask them to find ways to answer the following questions:
- How many peas would the boy have dropped on the floor?
- How many cups, quarts, cubic centimeters, cubic feet, etc. would that be?
- Could that many peas really fill up a room to the level of a table top?
- What is the volume of 1 pea in cubic centimeters, cups, cubic inches, etc.?
- What is the mass of one pea?
- What is the weight of one pea?

** To measure cubic centimeters or cubic inches, make boxes from centimeter graph paper or inch graph paper. See the attached model. It is best to give students the graph paper and have them figure out how to make the boxes.

3. Read pages 20 and 21 of *Counting on Frank*.

Ask students to

- make a simple model of an insect using blocks. (It could be one block thick, two blocks wide, and four blocks long, for example.)
- make it twice as big – twice as thick, twice as wide, twice as long. (That would be 2 by 4 by 8.)
- keep making their insect bigger – three times as big, four times as big, etc. and keep a chart of how many blocks are used.
- look for patterns to predict how many blocks it would take to make an insect 100 times as big.

What about 4 million!

4. Read selected pages from *If You Hopped Like a Frog* by David M. Schwartz.

ISBN-10: 0590098578

ISBN-13: 978-0590098571

Refer to the discussion of each page at the back of the book.

Ask students to

- do calculations using their own heights, lengths of body parts, etc. For example, one page says "If you craned your neck like a crane, you'd have to stretch your arm w-a-a-ay up to scratch your head!" The information in the book states that a crane has a neck $\frac{1}{3}$ of its height. Ask students to calculate how long their necks would be.
- research the animals mentioned and give more details about their characteristics.

5. Read *Hatchet* by Gary Paulsen.

ISBN-10: 1416936475

ISBN-13: 978-1416936473

As you read the book, make a list of all of the science and mathematics facts that Brian uses.

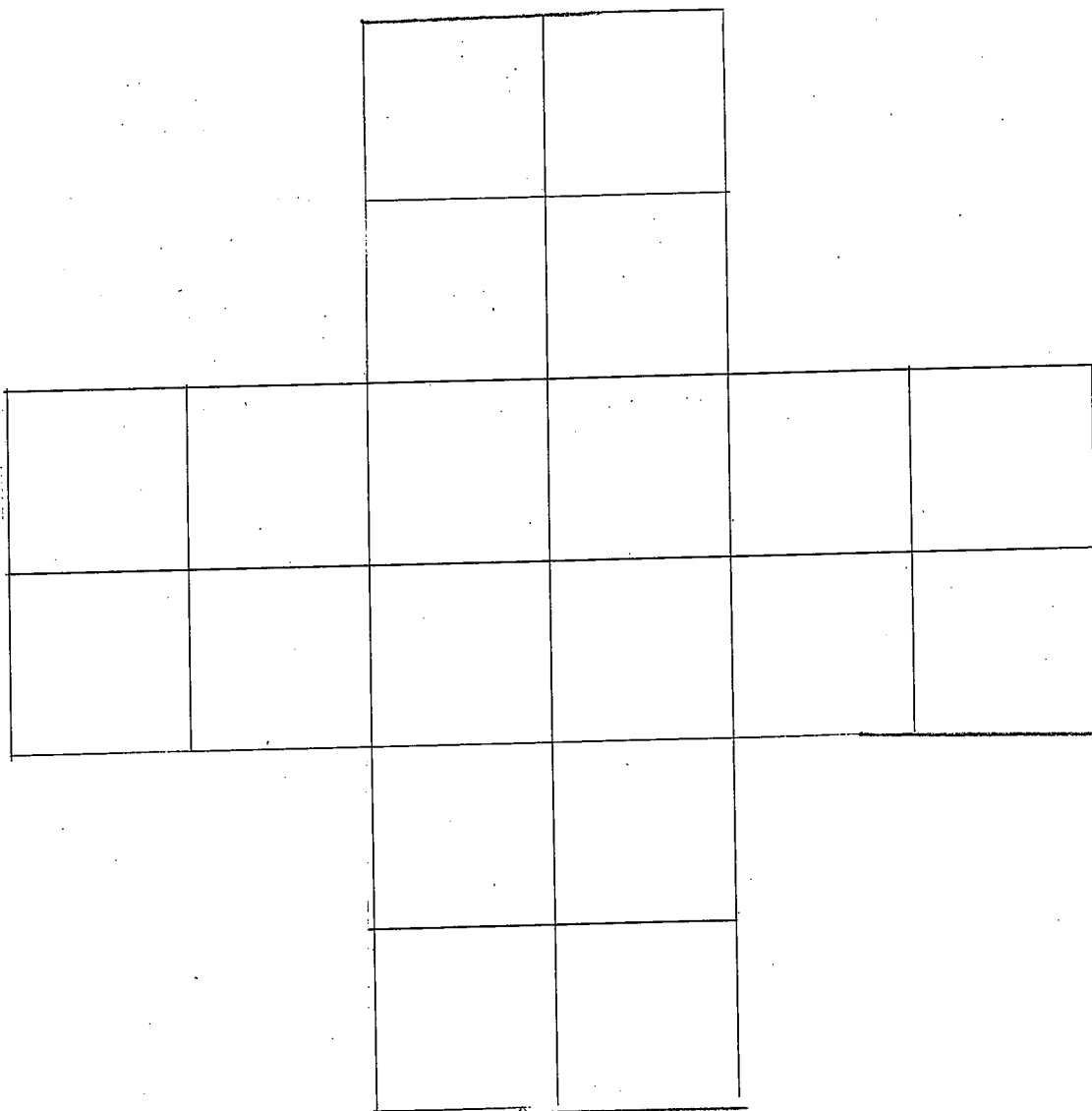
On pages 17-24, Brian tries to fly the plane. Investigate how his actions affect the way the plane behaves in the air. Why does this happen?

What happens when Brian tries to fish? What science facts make this a problem?

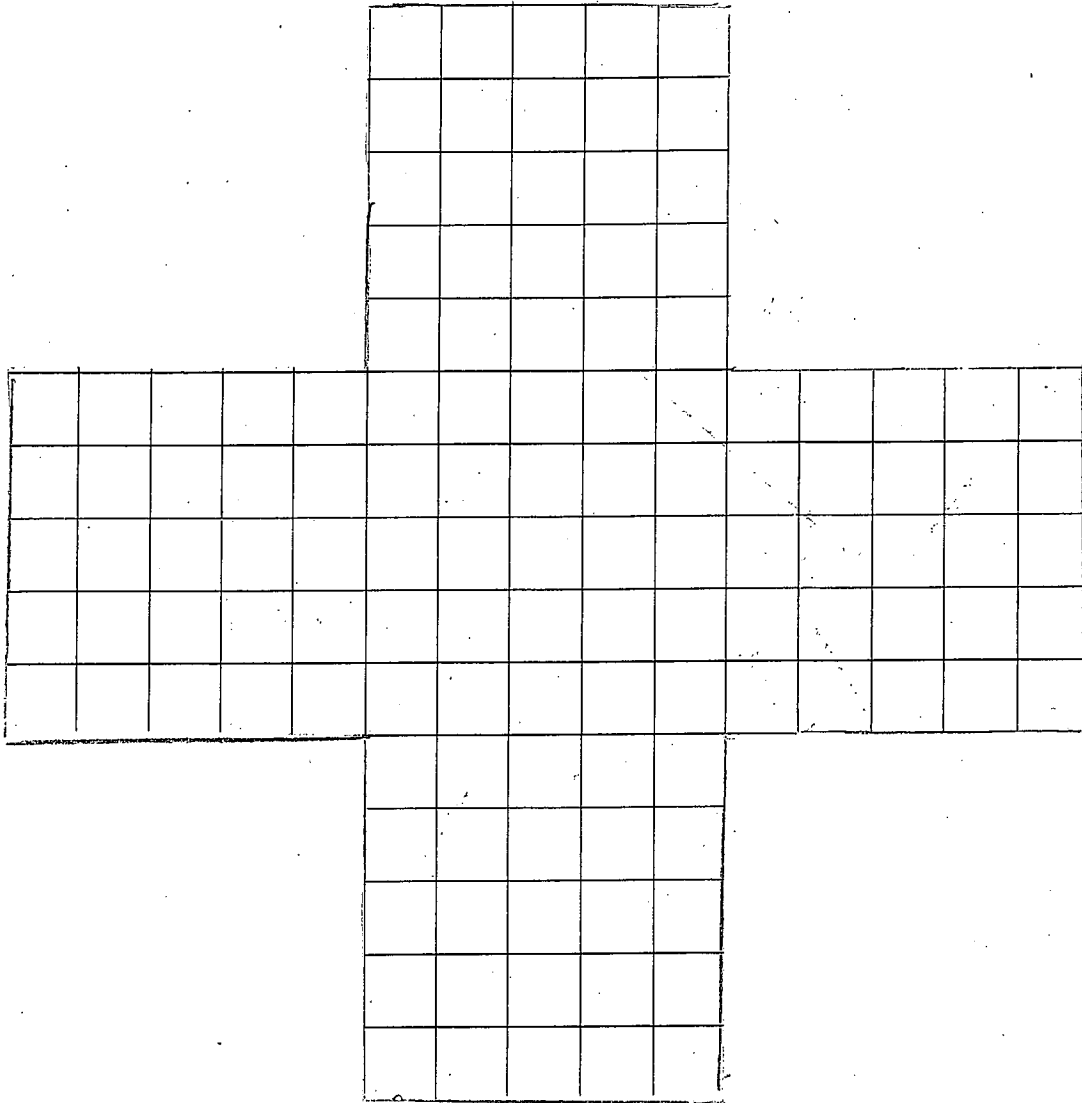
How does Brian make a fire?

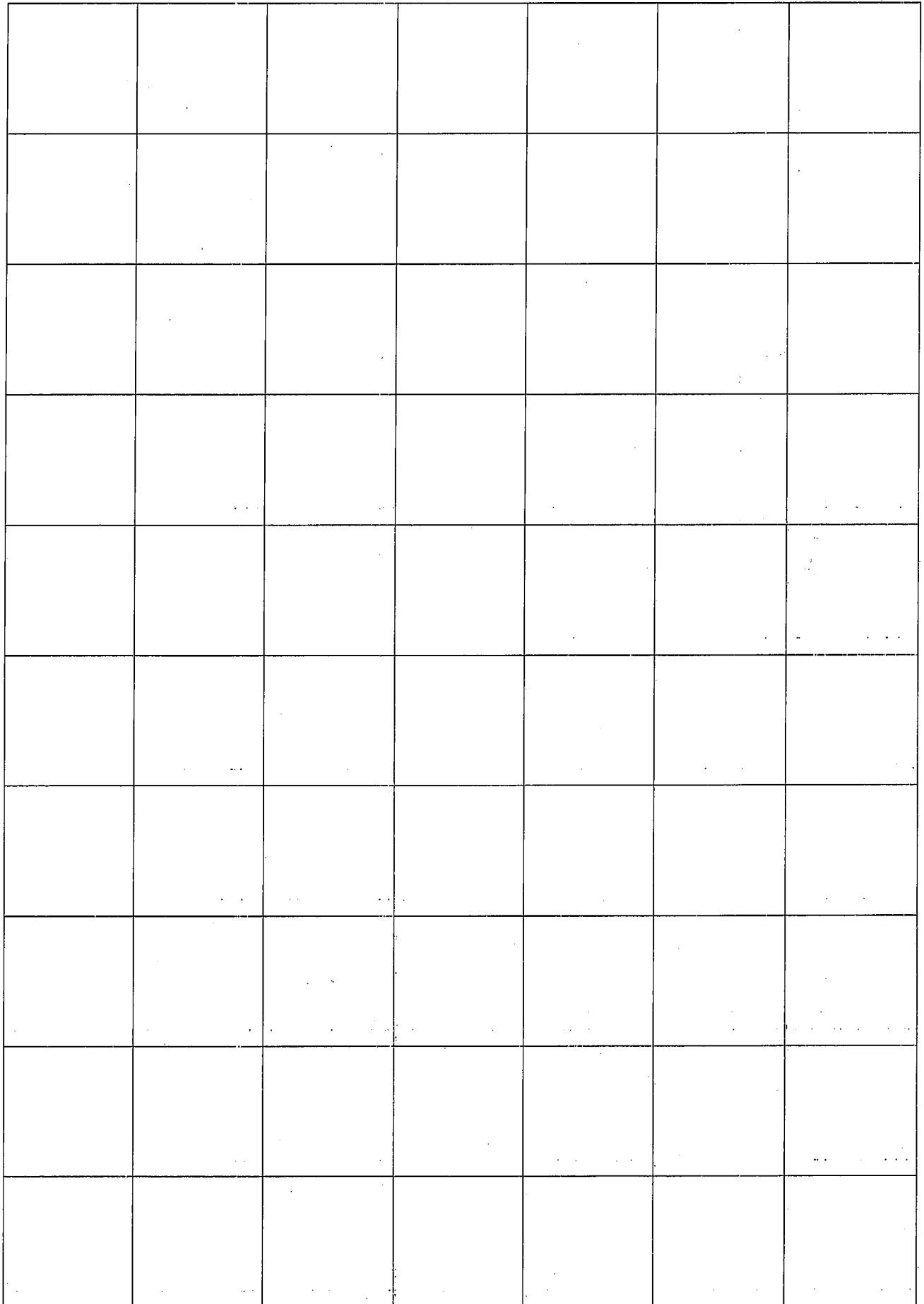
Have students brainstorm about how they would use science and mathematics to survive in the woods.

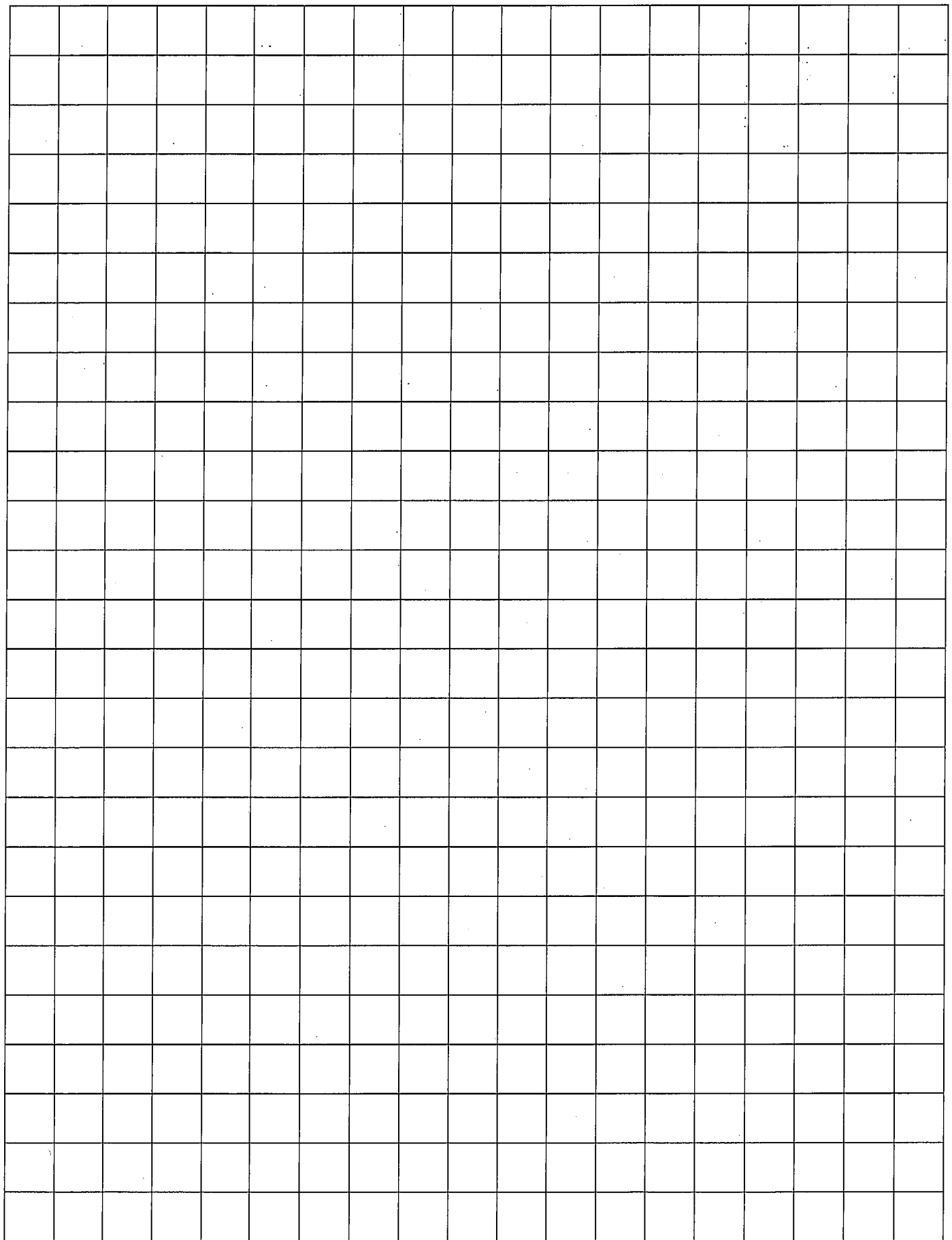
This box would hold 8 cubic inches.



This box would hold 125 cubic centimeters.







Lightning Strike Again! And Comparing Grizzly Bears and Black Bears are from
Measuring Up: Prototypes for Mathematics Assessment

published by Mathematical Science Education Board, National Research Council.

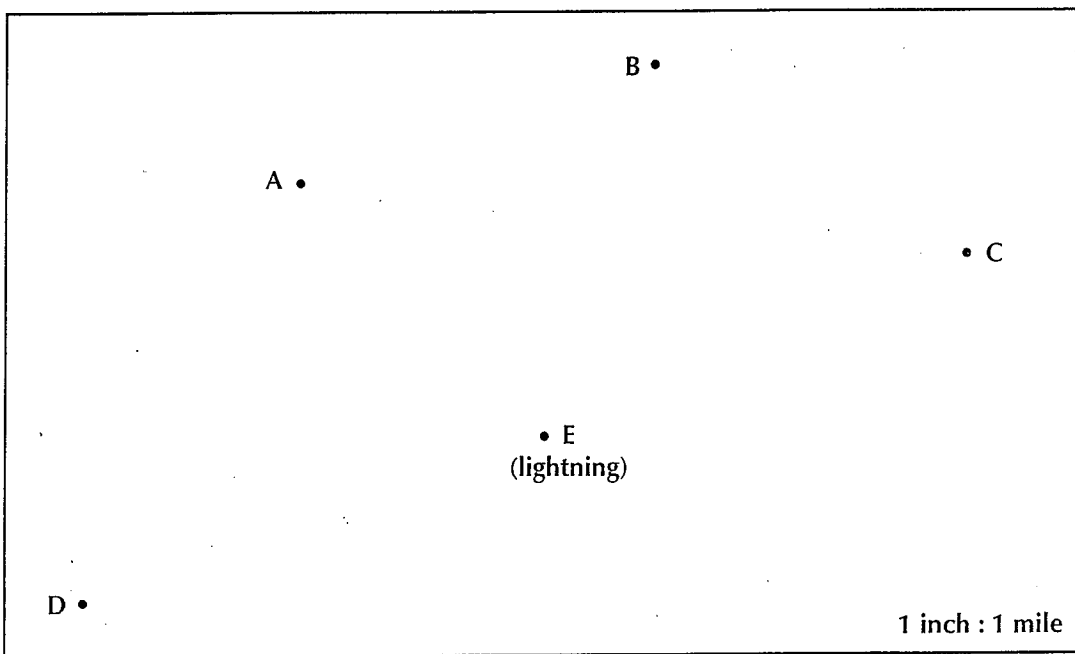
Available from the National Academies Press at
http://www.nap.edu/catalog.php?record_id=2071#toc

Read it online or purchase a hard copy.

Name _____ Date _____

One way to estimate the distance from you to where lightning strikes is to count the number of seconds until you hear the thunder, and then divide by five. The number you get is the approximate distance in miles.

People are standing at the four points A, B, C and D. They saw lightning strike at point E. Because sound travels more slowly than light, they did not hear the thunder right away.



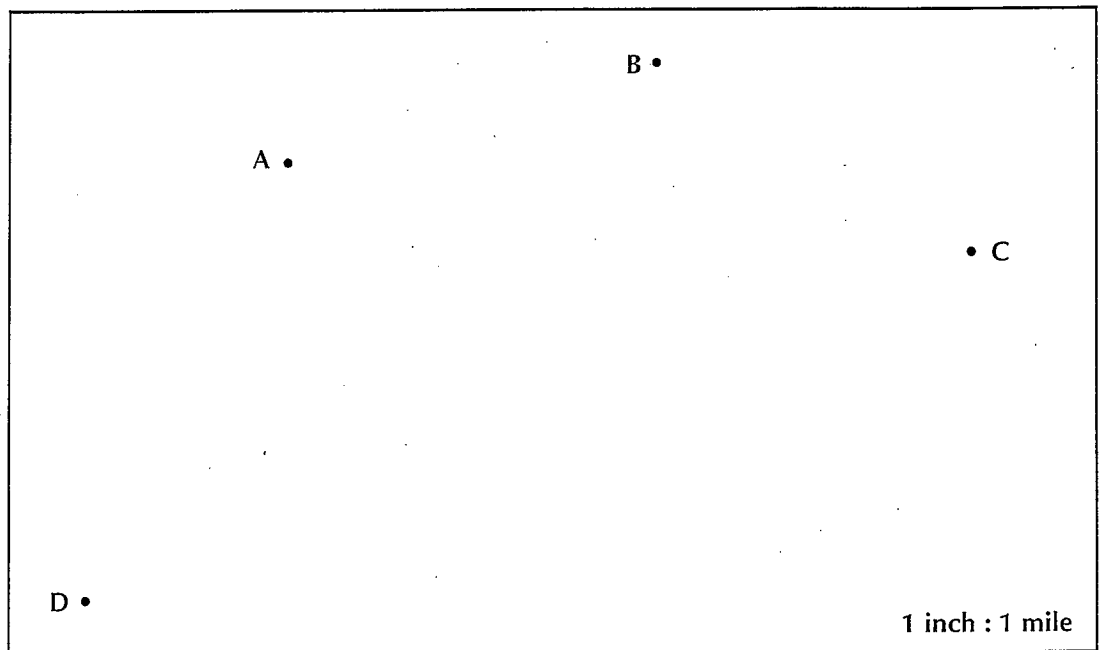
1. Who heard the thunder first? _____ Why?

2. Who heard it last? _____ Why?

3. One of the people heard it after 12 seconds. Who was it? _____
Explain your answer.

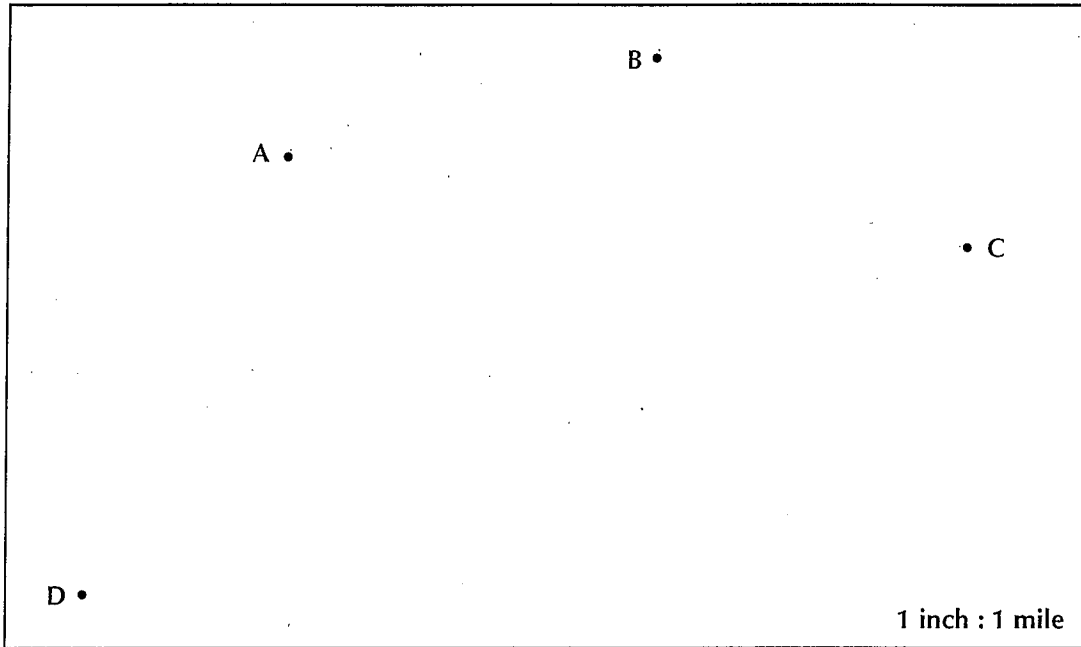
4. After how many seconds did the person at B hear the thunder? _____
Show how you know.

5. Now suppose lightning strikes again at a different place. The person at A and the person at C both hear the thunder after the same amount of time. Show on the map below where the lightning might have struck.



6. In question 5, are there other places where the lightning could have struck? _____ If so, show as many of those places as you can.

7. Lightning struck again! The person at point A heard the thunder 5 seconds after she saw the lightning. Show as many points as you can where the lightning could have struck.



8. The person at point C heard the thunder from that same lightning bolt 15 seconds after the lightning struck. Show where the lightning could have struck.

Name _____ Date _____

The data below give the weights of some grizzly bears and black bears living in the Rocky Mountains in Montana.

Grizzly bears			Black bears		
Bob	Male	220 lbs.	Blackberry	Female	230 lbs.
Rocky	Male	170 lbs.	Greta	Female	150 lbs.
Sue	Female	210 lbs.	Freddie	Male	140 lbs.
Linda	Female	330 lbs.	Harry	Male	230 lbs.
Wilma	Female	190 lbs.	Ken	Male	170 lbs.
Ed	Male	180 lbs.	Hilda	Female	220 lbs.
Glenda	Female	290 lbs.	Grumpy	Male	160 lbs.
Bill	Male	230 lbs.	Blackfoot	Female	150 lbs.
			Marcy	Female	170 lbs.
			Grempod	Male	200 lbs.

1. Organize these data in a way that would help you find which kind of bear is heavier — grizzly bears or black bears. (You can use another piece of paper to do this. Please be sure to put your name on it!)
2. Write down three things that you can tell about the weights of the bears. (You may want to use your answer from question 1 to help you.)

3. Based on these data, how much heavier is a typical bear of one kind than a typical bear of the other kind? _____

How did you figure out your answer?