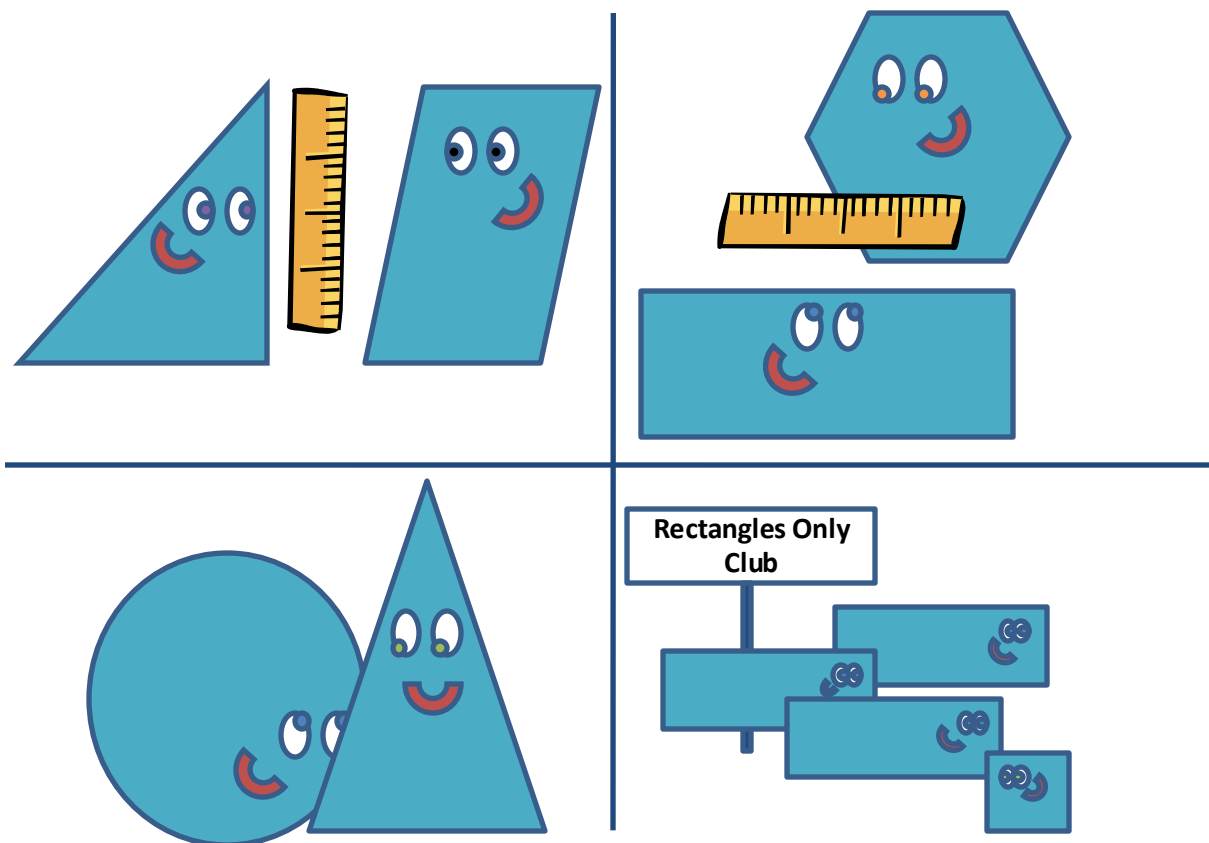


GEOMETRY & MEASUREMENT FOR ALL SHAPES & SIZES

Third Edition



Shelbi Cole
Nancy Heilbronner
E. Jean Gubbins
Jeffrey Corbishley
Jennifer Savino
Rachel McAnallen

University of Connecticut

October 2010

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Student Mathematician Journal

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UConn

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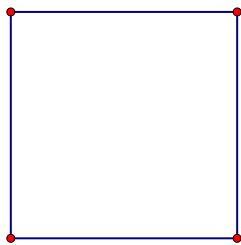
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Shape Inspector: _____

Comparing Shapes

Directions: For each shape, write the number of sides, angles, and vertices.



Number of Sides: _____

Number of Angles: _____

Number of Vertices: _____



Number of Sides: _____

Number of Angles: _____

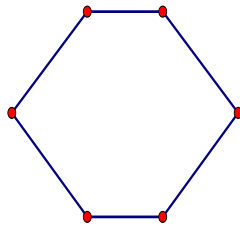
Number of Vertices: _____

Directions: Use the two shapes above to tell whether each statement below is TRUE or FALSE.

Statement	True or False?
1. Both shapes have four sides.	
2. Both shapes have four angles.	
3. Both shapes have six vertices.	
4. All sides are the same length on both shapes.	



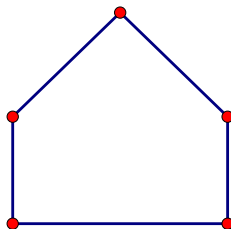
Directions: For each shape, write the number of sides, angles, and vertices.



Number of Sides: _____

Number of Angles: _____

Number of Vertices: _____



Number of Sides: _____

Number of Angles: _____

Number of Vertices: _____

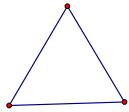
Directions: Use the two shapes above to tell whether each statement below is TRUE or FALSE.

Statement	True or False?
1. Both shapes have six sides.	
2. Both shapes have six angles.	
3. Both shapes have <i>more than</i> four vertices.	
4. One shape has <i>fewer than</i> six sides.	

Shape Multiplier: _____

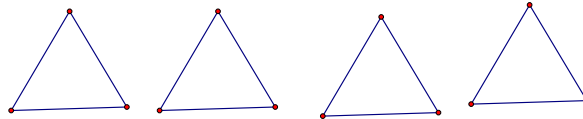
How Many Sides?

For each problem below, fill in the blanks. Then represent the problem with pictures and with a multiplication problem.

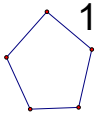


Example: This shape has 3 sides. If I drew 4 of these shapes, I would have 12 sides all together.

Represent with pictures:



Represent with multiplication: *3 sides x 4 shapes = 12 sides all together*

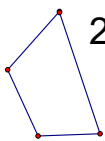


1. This shape has _____ sides. If I drew 2 of these shapes, I would have _____ sides all together.

Represent with pictures:

Represent with multiplication:

_____ sides x _____ shapes = _____ sides all together



2. This shape has _____ sides. If I drew 8 of these shapes, I would have _____ sides all together.

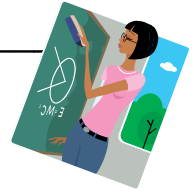
Represent with pictures:

Represent with multiplication:

_____ sides x _____ shapes = _____ sides all together.

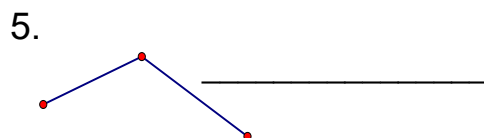
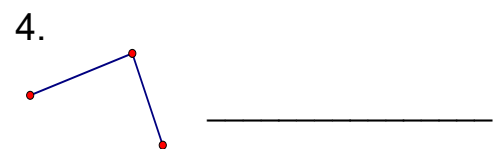
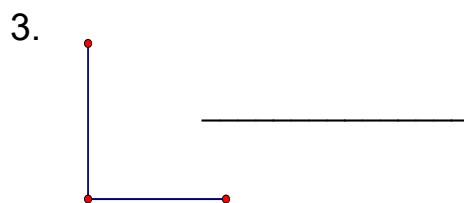
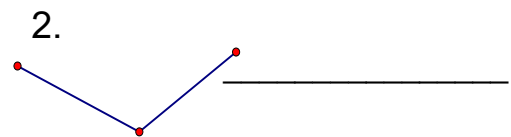
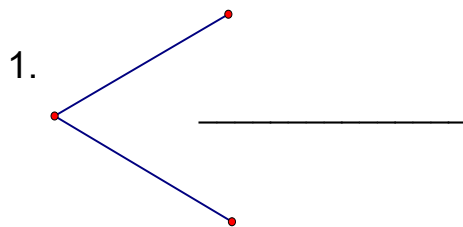


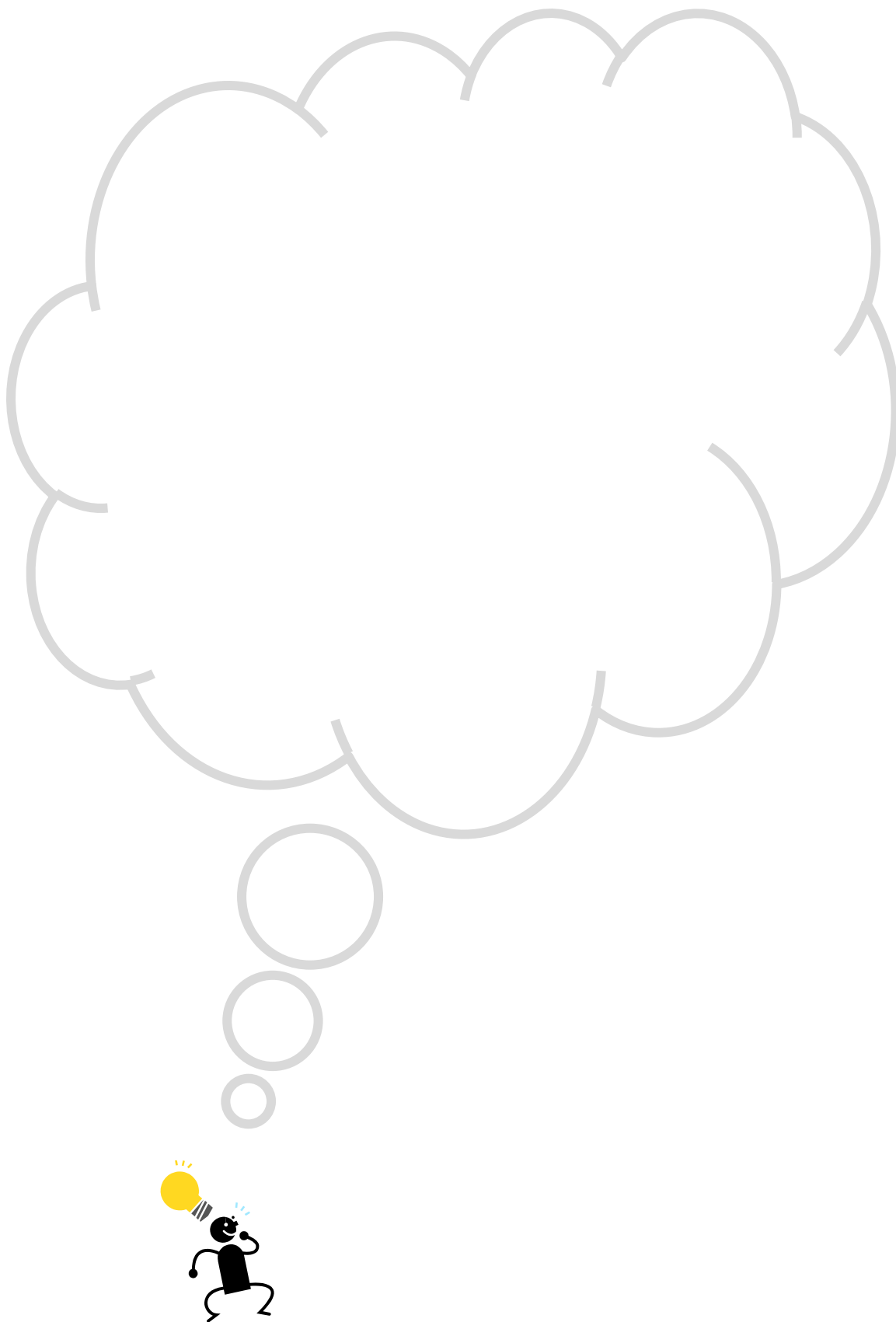
Angle Expert: _____



AM I RIGHT?

Directions: Next to each angle, write whether it is RIGHT or NOT RIGHT.





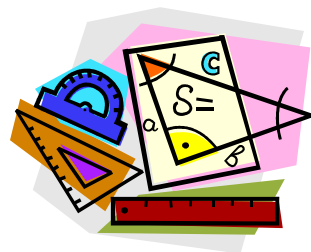
Draw each shape and circle whether or not it has right angles.

7. RECTANGLE: Right Angles? YES NO

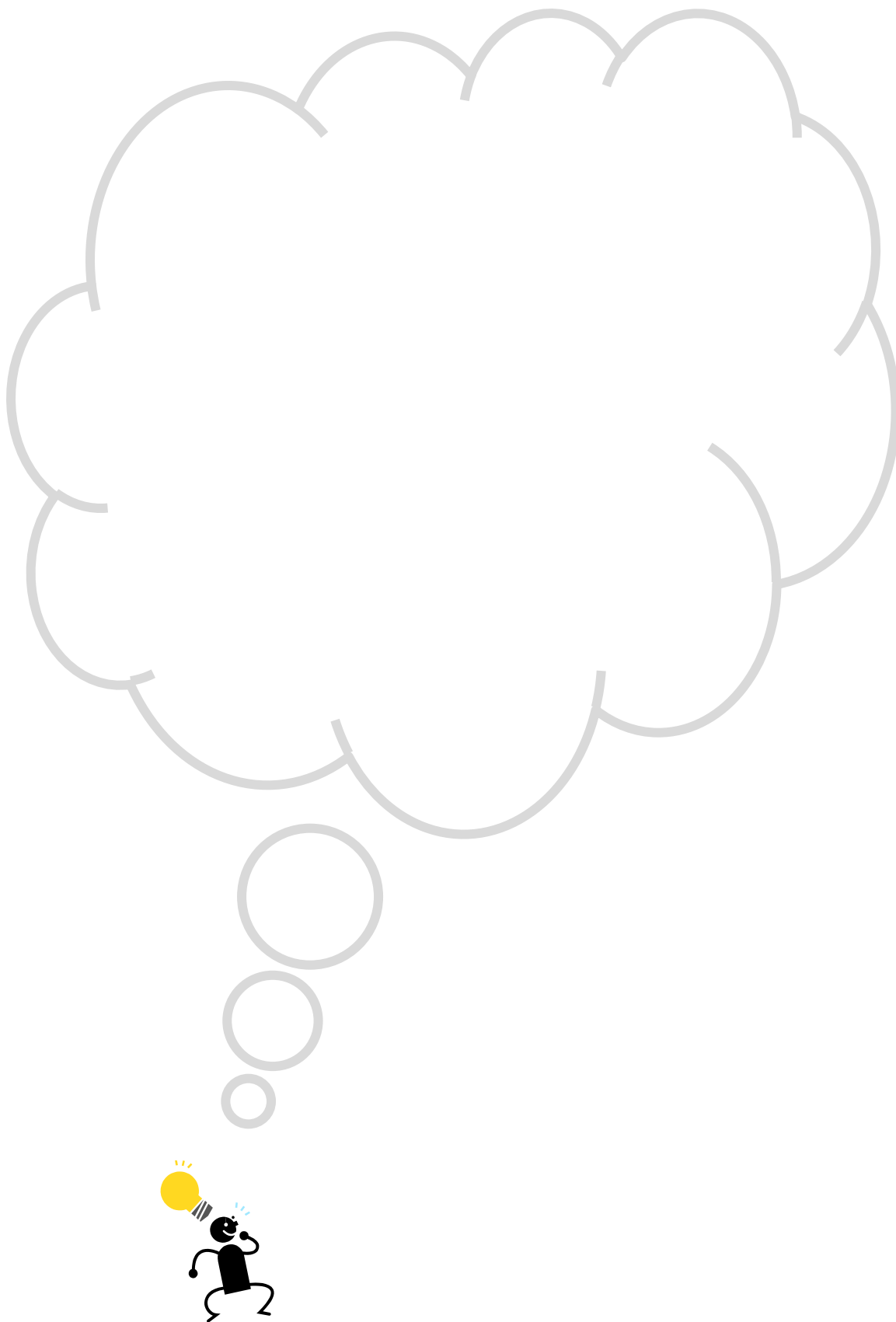
8. SQUARE: Right Angles? YES NO

9. CIRCLE: Right Angles? YES NO

10. Draw a triangle with 1 right angle if possible, or write NOT POSSIBLE.



11. Draw a triangle with no right angles if possible, or write NOT POSSIBLE.



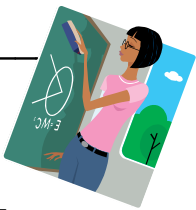
12. Draw a triangle with 2 right angles if possible, or write NOT POSSIBLE.

13. DESIGN TEAM TIME:

- Draw the front of a house. Do not use ANY RIGHT ANGLES in your drawing.
- Write 3 sentences about the person who lives in this house.

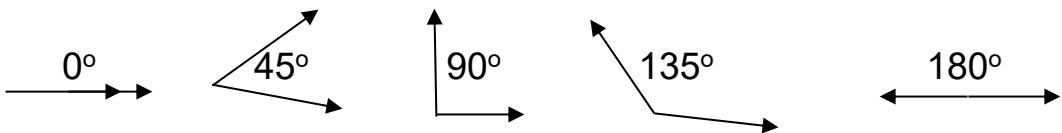


Angle Expert: _____

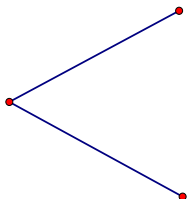


AM I RIGHT?

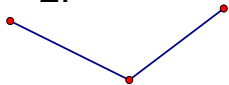
Directions: An angle measure tells how open an angle is. For example, if it is not open at all, it is 0° . If it is open all the way, it is 180° . The pictures below show some angles and their measures. Use these angles to estimate the measures of the angles below.



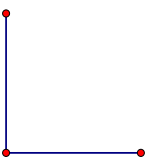
1.



2.



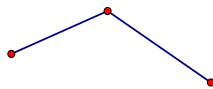
3.



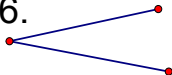
4.



5.



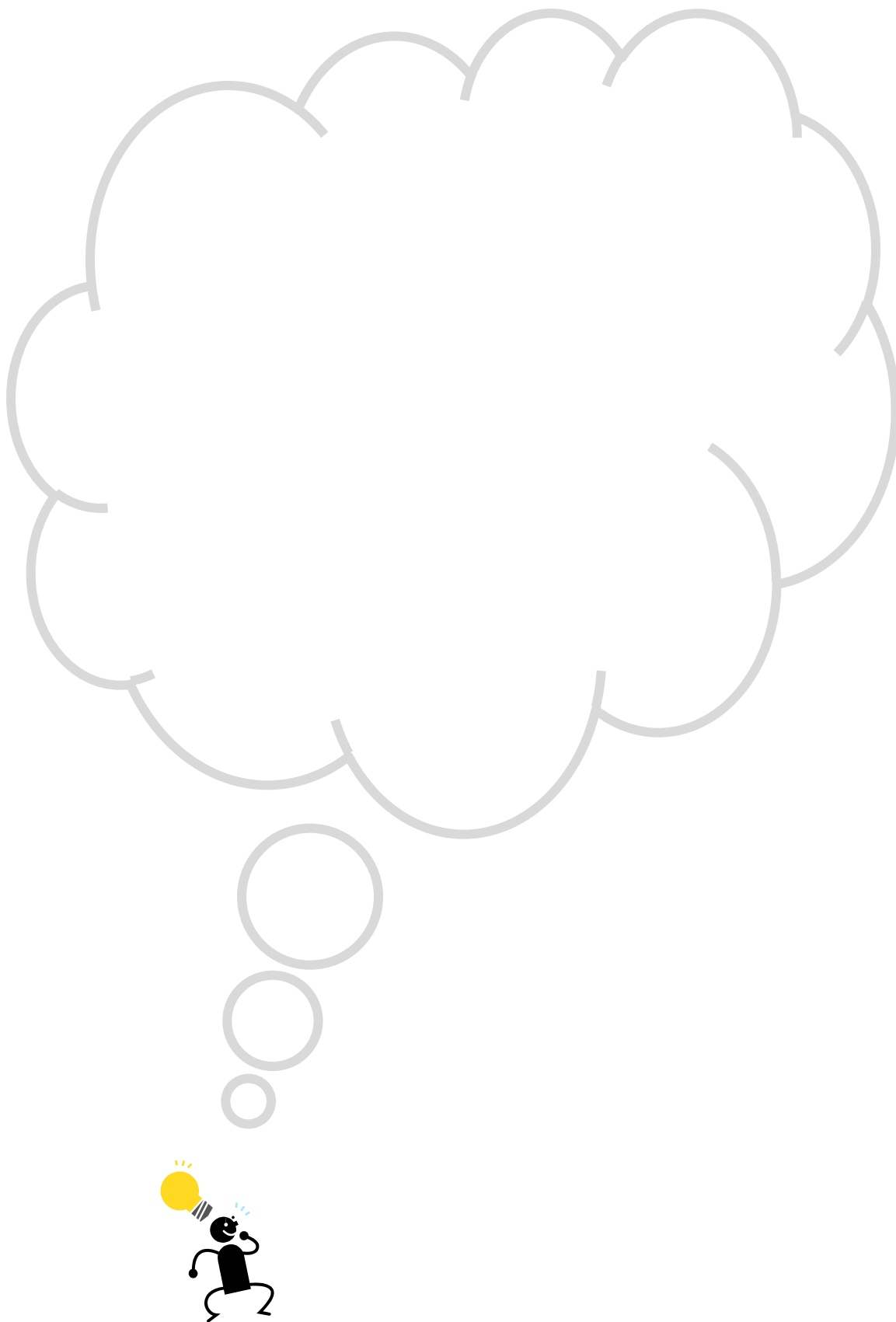
6.



7. Acute angles are less than 90° . Which angles are acute?

8. Obtuse angles are greater than 90° . Which angles are obtuse?

9. Right angles are exactly 90° . Which angles are right?





Draw each shape and circle whether or not it has right angles.

10. RECTANGLE: Right Angles? YES NO

11. SQUARE: Right Angles? YES NO

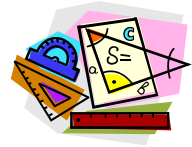
12. CIRCLE: Right Angles? YES NO

13. Draw a triangle with 1 right angle if possible, or write NOT POSSIBLE.

14 Draw a triangle with no right angles if possible, or write NOT POSSIBLE.



15. Draw a triangle with 2 right angles if possible, or write NOT POSSIBLE.



16. DESIGN TEAM TIME:

- Draw the front of a house. Do not use ANY RIGHT ANGLES in the drawing.
- Write 3 sentences about the person who lives in this house.



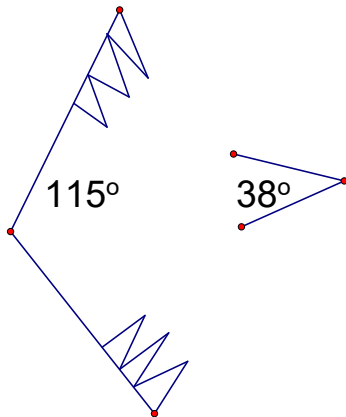
Angle Adder: _____

Angles Eat, Too!

Hungry Angle Postulate: When an angle eats another angle, it gains that many degrees. (It is similar to people eating food to grow taller.)

Use the Hungry Angle Postulate to figure out how big each angle will be after it eats the smaller angle. Write an addition problem and a sentence. Then, draw the new angle formed by combining both.

EXAMPLE:

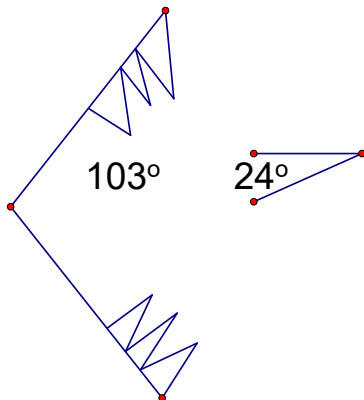
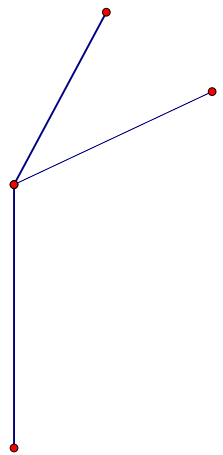


Addition Problem:

$$115^\circ + 38^\circ = \underline{153^\circ}$$

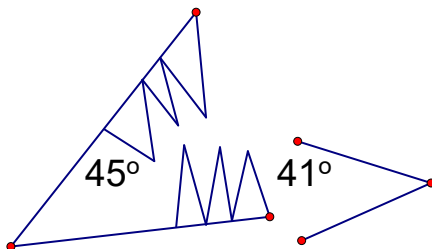
Sentence:

When a 115° angle eats a 38° angle, it becomes a 153° angle.



Addition Problem:

Sentence:



Addition Problem:

Sentence:



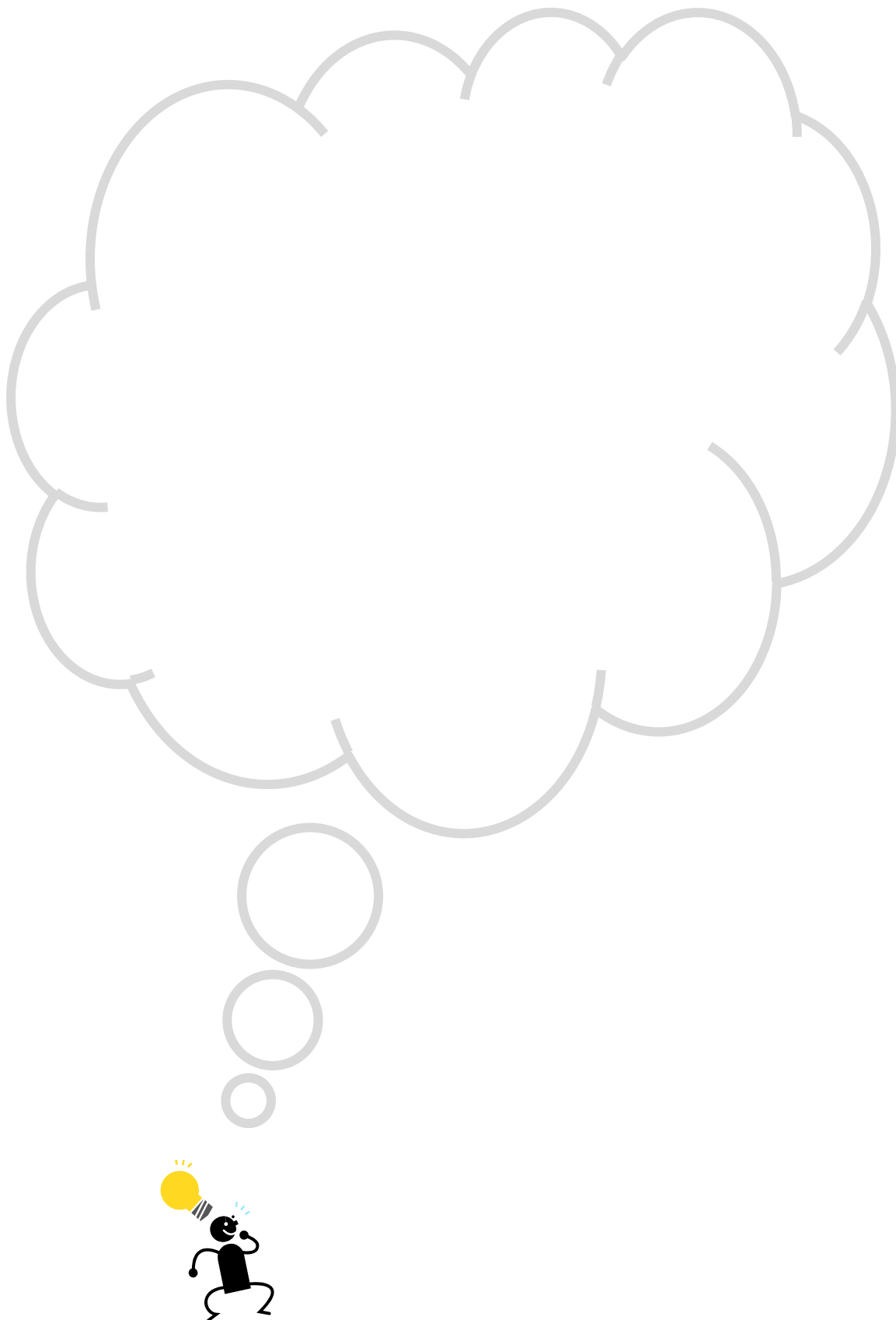
Shape Author: _____

The Greedy Triangle (Burns, 1995)

Directions: Write the names of the shapes you know and then fill in the rest as your teacher reads the story.

Name of Shape	Number of Sides	Number of Angles
	3	
	4	
	5	
	6	
	7	
	8	
	9	
	10	





Directions: Use your table and details from the story to answer each question.

1. What is a shape with 8 sides called? _____

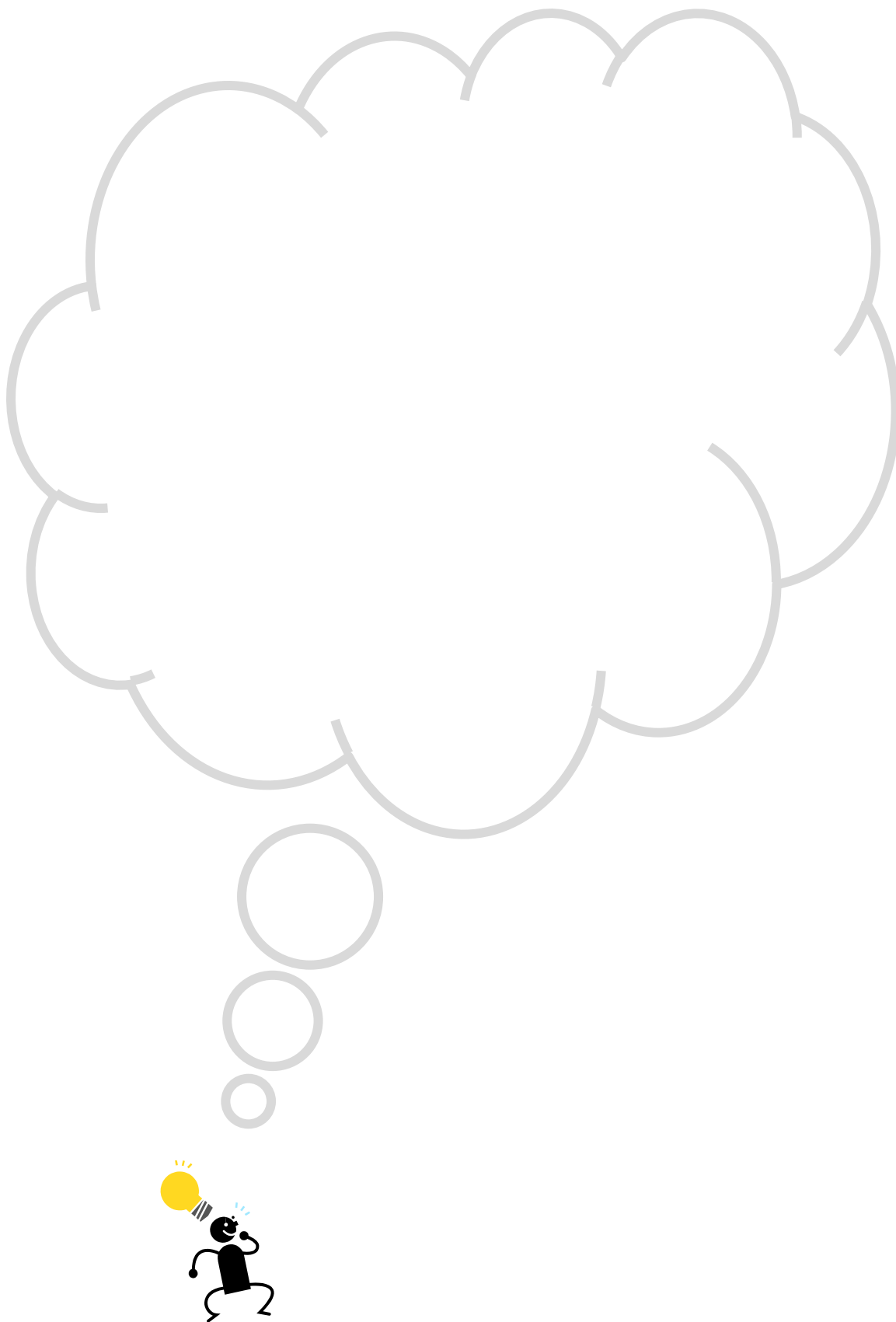
2. How many sides does a pentagon have? _____

3. How many angles does a heptagon have? _____

4. What is true about the number of sides and the number of angles in a shape?

5. Why do you think the book is called *The Greedy Triangle*?

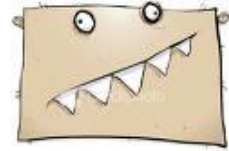
Burns, M. (1995). *The greedy triangle*. New York, NY: Scholastic Press.



Author: _____



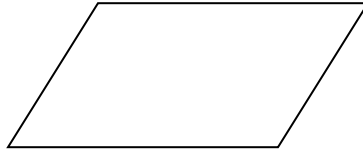
Design Your Own Shape Story



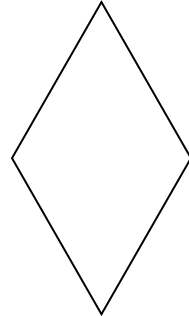
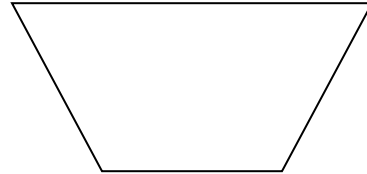
Rectangle



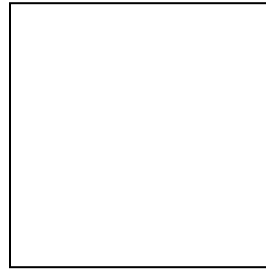
Parallelogram



Trapezoid



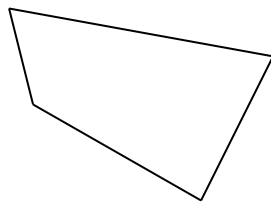
Rhombus



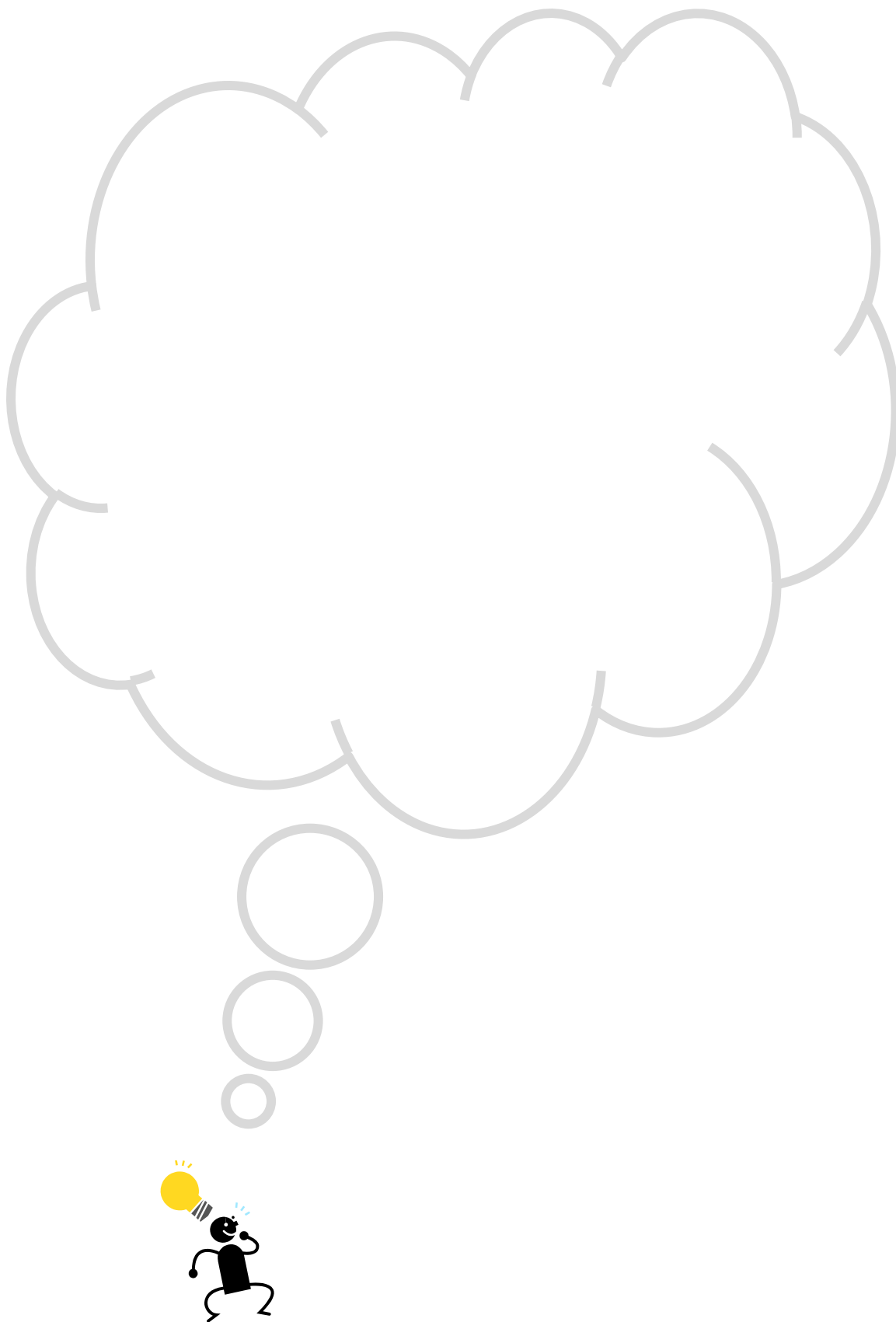
Square

Directions:

1. Write a story about the quadrilateral in the picture below. (Don't forget to give your shape a name!)



2. In your story the quadrilateral must change into each of the 5 different quadrilaterals at the top of this page.
3. As the quadrilateral changes, tell what makes it similar or different from its previous shape using terms like sides, angles, and vertices.
4. You may cut the pictures out to use in your story, or you may draw your own.
5. In the beginning of your story, tell why the quadrilateral is not happy and wants to change.

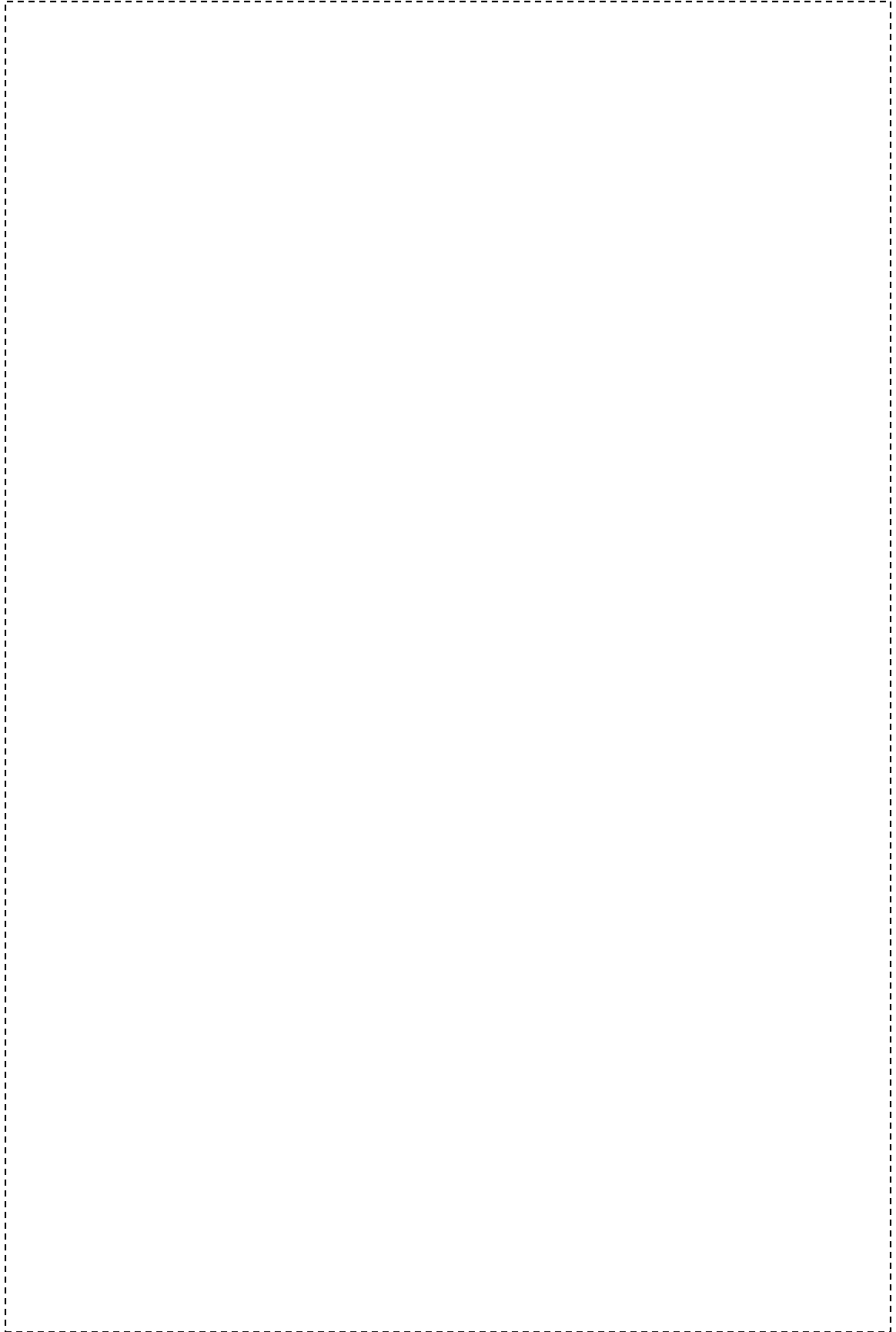


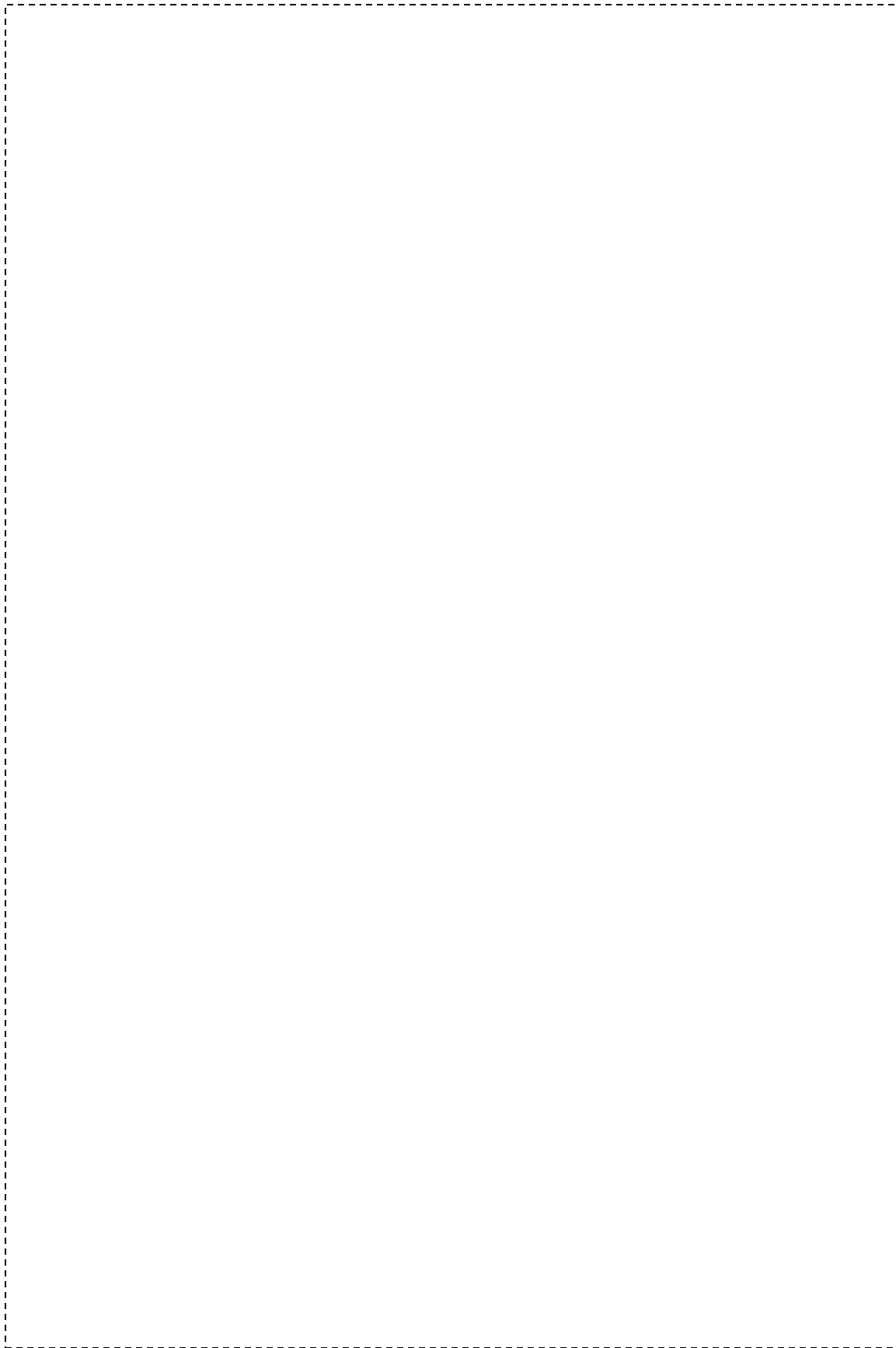
Use the lined pages to write your story and the blank pages for illustrations. Staple your pages together.

Shape Author: _____

[illegible]

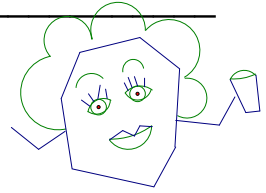
A large rectangular area with a dashed border, containing 20 horizontal lines for writing. The lines are evenly spaced and extend across most of the width of the box.





Angle Accountant: _____

The Annual Shape Party



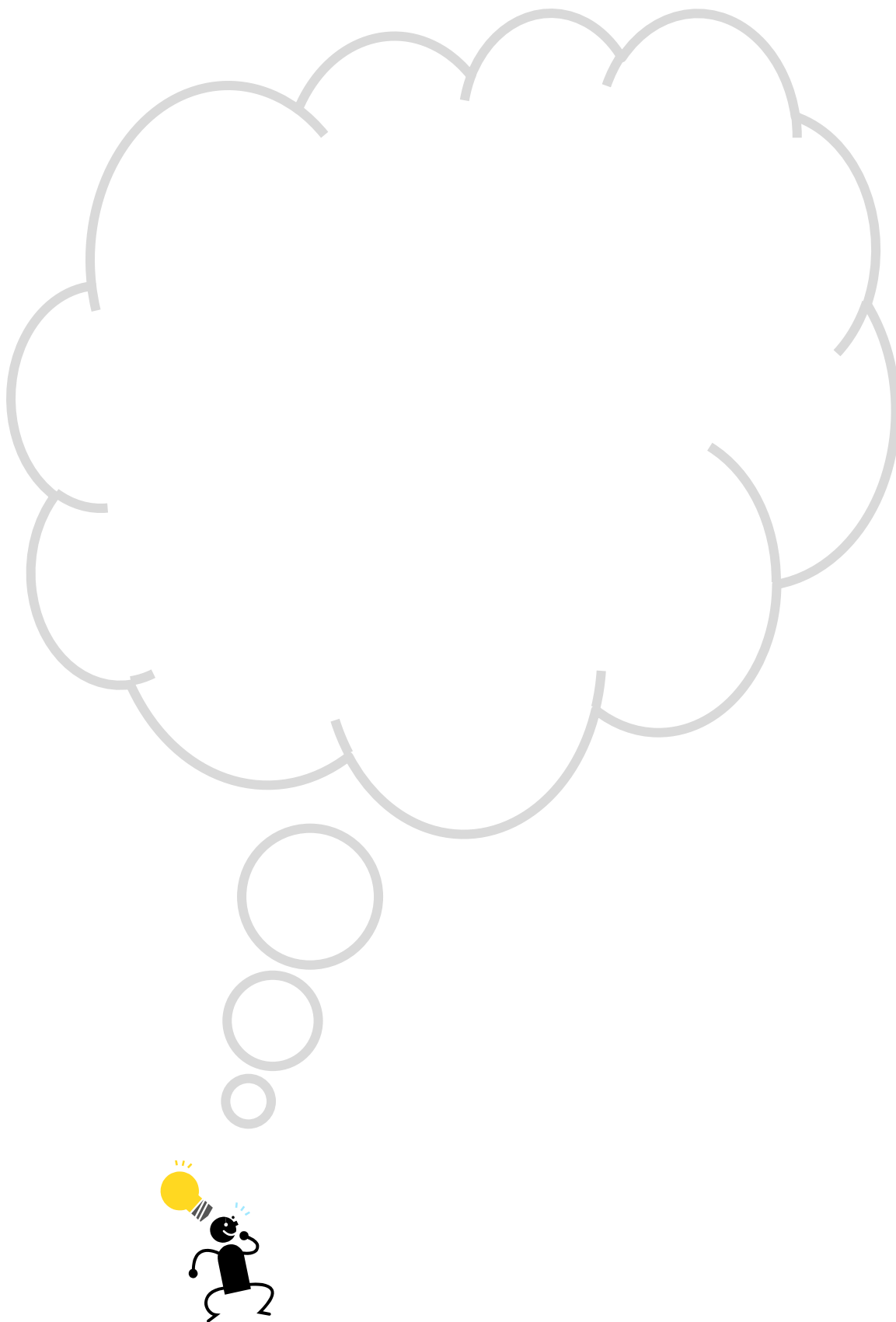
At the annual shape party, shapes gather to have fun. This year's host, Helena Heptagon, has offered a prize to the first person who figures out how many angles are in the room. No guessing!! Helena wants to see how you got your answer.

The guests include:

2 circles, 4 triangles, 3 quadrilaterals, 7 pentagons, 1 hexagon, 2 heptagons (including Helena), and 3 octagons

Use the space below to calculate the total number of angles in the room. You may draw pictures to help you.

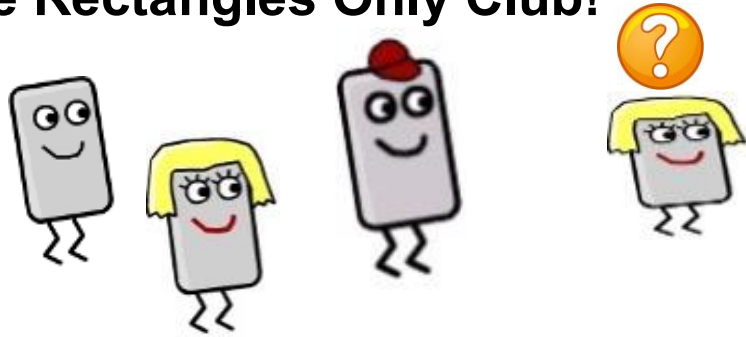
There are _____ angles in the room all together.



Play: The Rectangles Only Club!

Characters:

Rosie Rectangle
Robert Rectangle
Rashawn Rectangle
Sally Square



How to Read a Play:

1. The name in front of the colon tells who should read the line.

EXAMPLE—Rosie would read this line without reading her name:

Rosie: I'm bored.

2. The *italicized* words ARE NOT read out loud! They tell the reader WHAT to do.

Play: The Rectangles Only Club!

Rosie: I'm bored. School is over and I have nothing to do. Being a rectangle is so boring. Maybe I'll call Robert.
(Holds up pretend phone and calls Robert.)

Robert: Hello.

(Holds up pretend phone.)

Rosie: Hi, Robert. I'm just calling because I'm bored. What should rectangles like us do on such an afternoon?

Robert: I'm bored, too. Let me call Rashawn, and we can all meet at my house to decide what to do.

Rosie: Good idea. I'll see you there.

(Robert calls Rashawn.)

Rashawn: Hello.

(Holds up pretend phone.)



Robert: Hi, Rashawn. Rosie is coming over and we want you to come, too. That way, we'll have three rectangles together, and we can find something to do.

Rashawn: Good idea. I'll be right over.

(The three rectangles meet at Robert's house.)

Rosie: So, what should we do?

Rashawn: How about building a clubhouse?

Robert: Yeah! What should we call it?

Rosie: How about the Rectangles Only Club?

Robert: That's a great name!

(The 3 rectangles begin building their clubhouse. Sally Square walks by.)

Sally: Hey, what are you doing?

Rashawn: We're building a Rectangles Only Club. Do you want to help?

Sally: Wow, that sounds fun, but I'm just a square.

Rosie: You're not just a square! You're a rectangle, too!

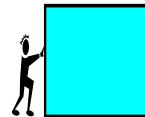
Sally: What do you mean? My sides are all the same length and yours are different.

Robert: Yeah, but to be a rectangle, all you need are 4 sides and 4 right angles!

Sally: Wow! Does that mean you are squares?

Quadrilateral Judge: _____

The Rectangles Only Club!



1. How should Robert answer Sally at the end of the play? Why?

2. The Rectangles and the Rhombuses have decided to have their own baseball teams. The rules for joining are:

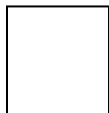
- To be on the Rectangle team, you must fit the definition of Rectangle.

Rectangle—A quadrilateral with 4 right angles.

- To be on the Rhombus team, you must fit the definition of a Rhombus.

Rhombus—A quadrilateral with 4 sides the same length.

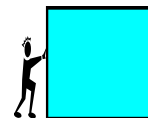
Samuel Square would like to join one of the teams. Which team can he join? Explain your answer.



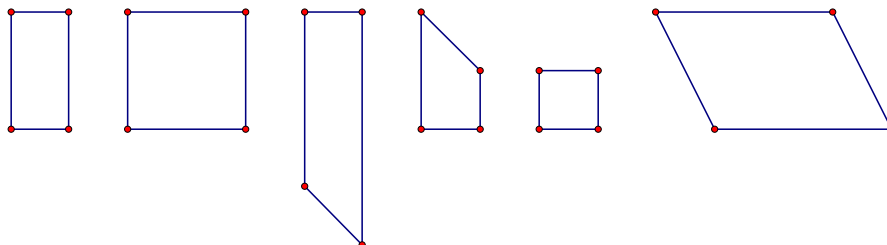


Quadrilateral Judge: _____

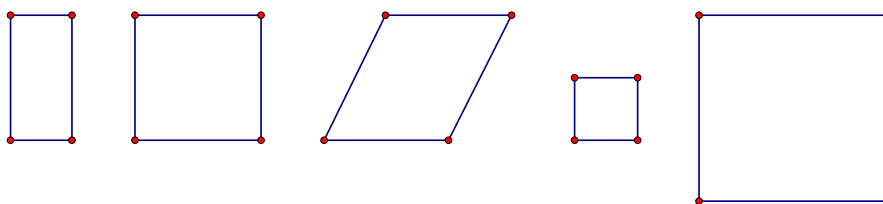
The Rectangles Only Club!



1. A rectangle has to have 4 sides and 4 right angles. Circle all of the rectangles you see.



2. A square has to have 4 sides that are the SAME LENGTH and 4 right angles. Circle all of the squares you see.



3. Is it possible to draw a square that is not a rectangle?

Yes No

4. Is it possible to draw a square that is not a rhombus?

Yes No

5. Is it possible to draw a rectangle that is not a square?

Yes No

6. How should Robert answer Sally at the end of the play? Why?



Side Searcher: _____

More Shapes, More Sides

Directions: Fill in the columns below so that the number of triangles matches the total number of sides.

Directions: Fill in the columns below so that the number of quadrilaterals matches the total number of sides.

Number of Triangles	Total Number of Sides	Number of Quadrilaterals	Total Number of Sides
2	6	7	28
5	15	3	12
7		5	
9		1	
1		12	
10		8	
14		15	
	9		8
	12		16
	18		24

Draw pictures to help you fill in the boxes!



2 triangles have 6 sides

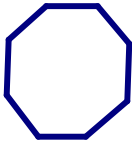
Explain why you cannot have a group of quadrilaterals with a total of 13 sides.



Name: _____ Date: _____

Check Up #1

Fill in the missing parts of the table.

Name of Shape	Number of Sides	Number of Angles	Drawing of Shape
Triangle			
Quadrilateral			
	5		
			
			

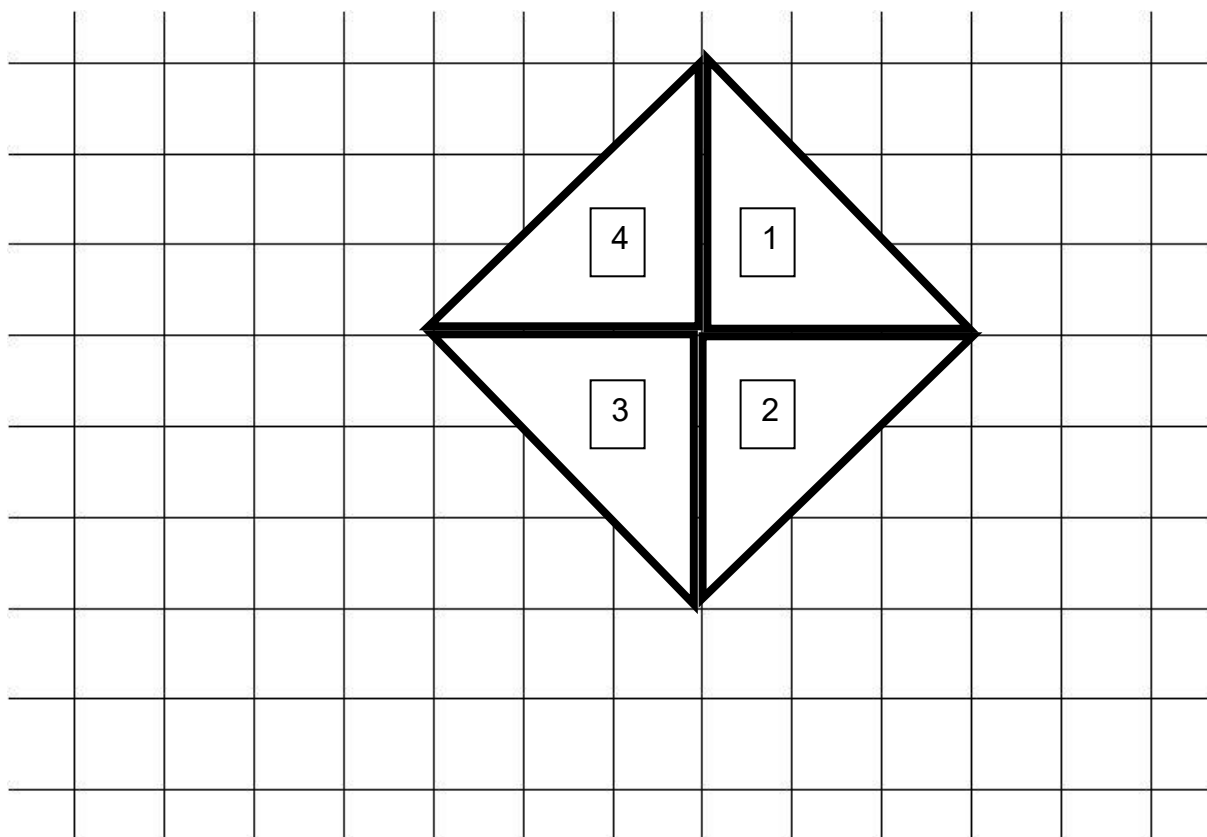
Draw an example of each type of angle.

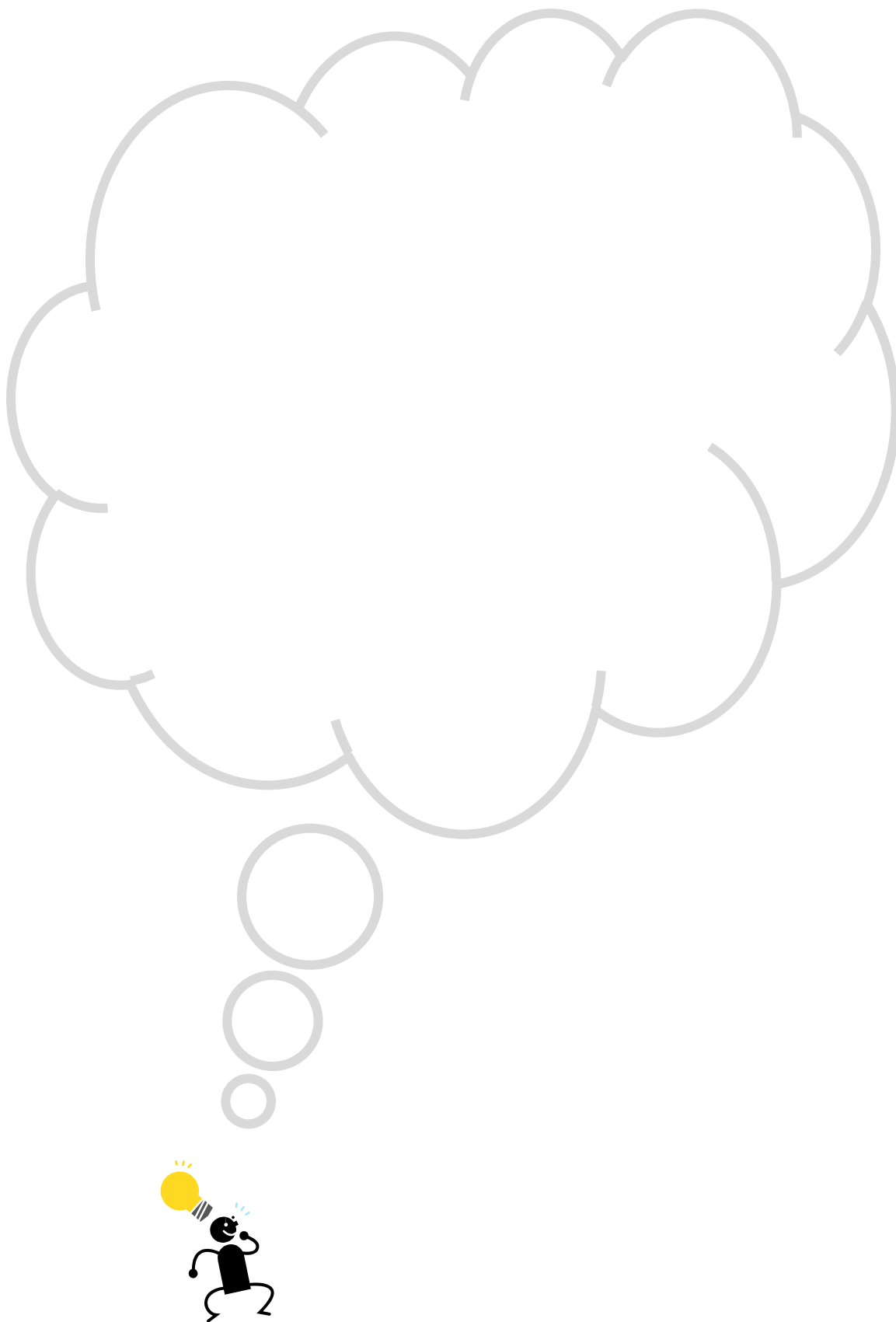
Acute	Obtuse	Right



Mathematical Transformer: _____

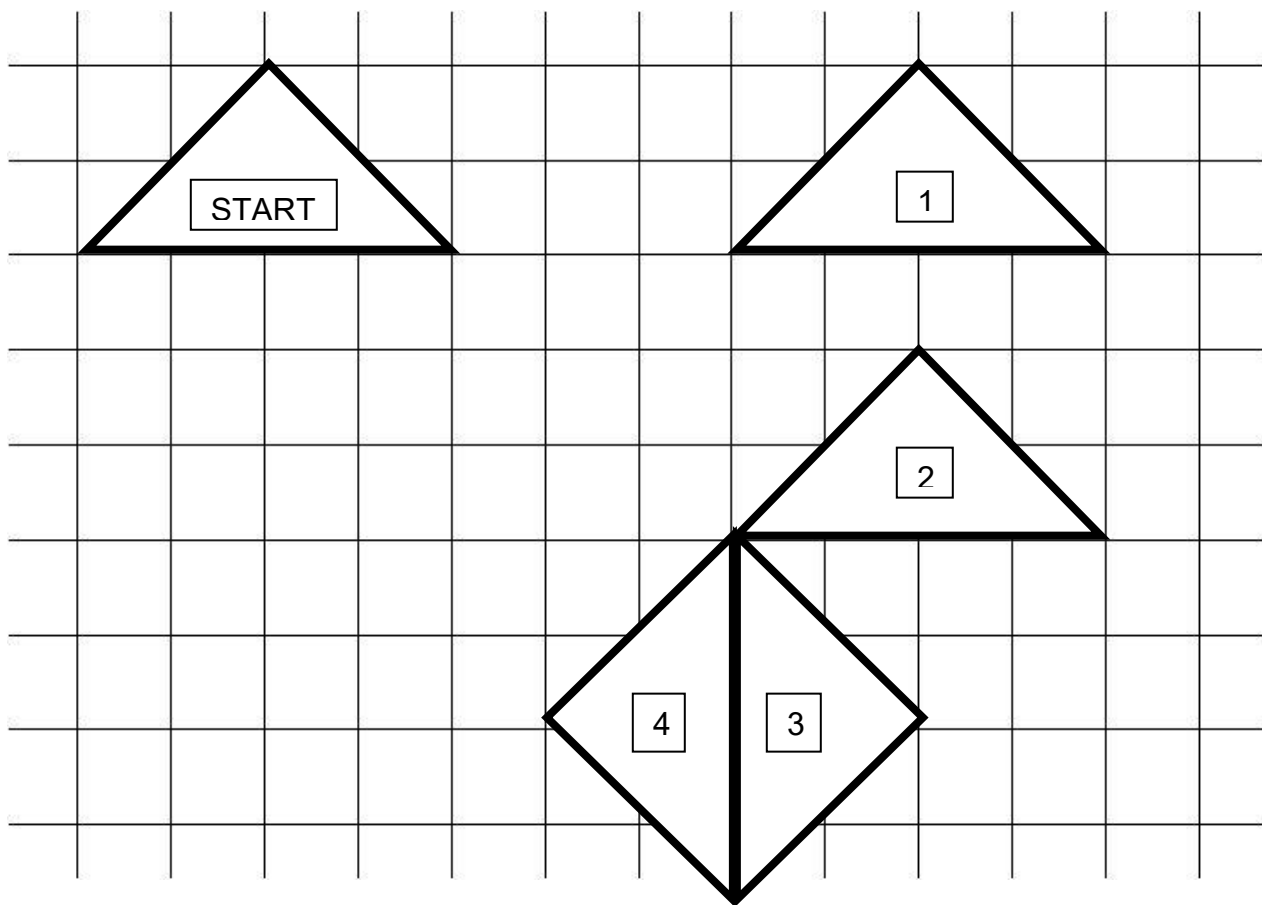
Turn, Turn, Turn

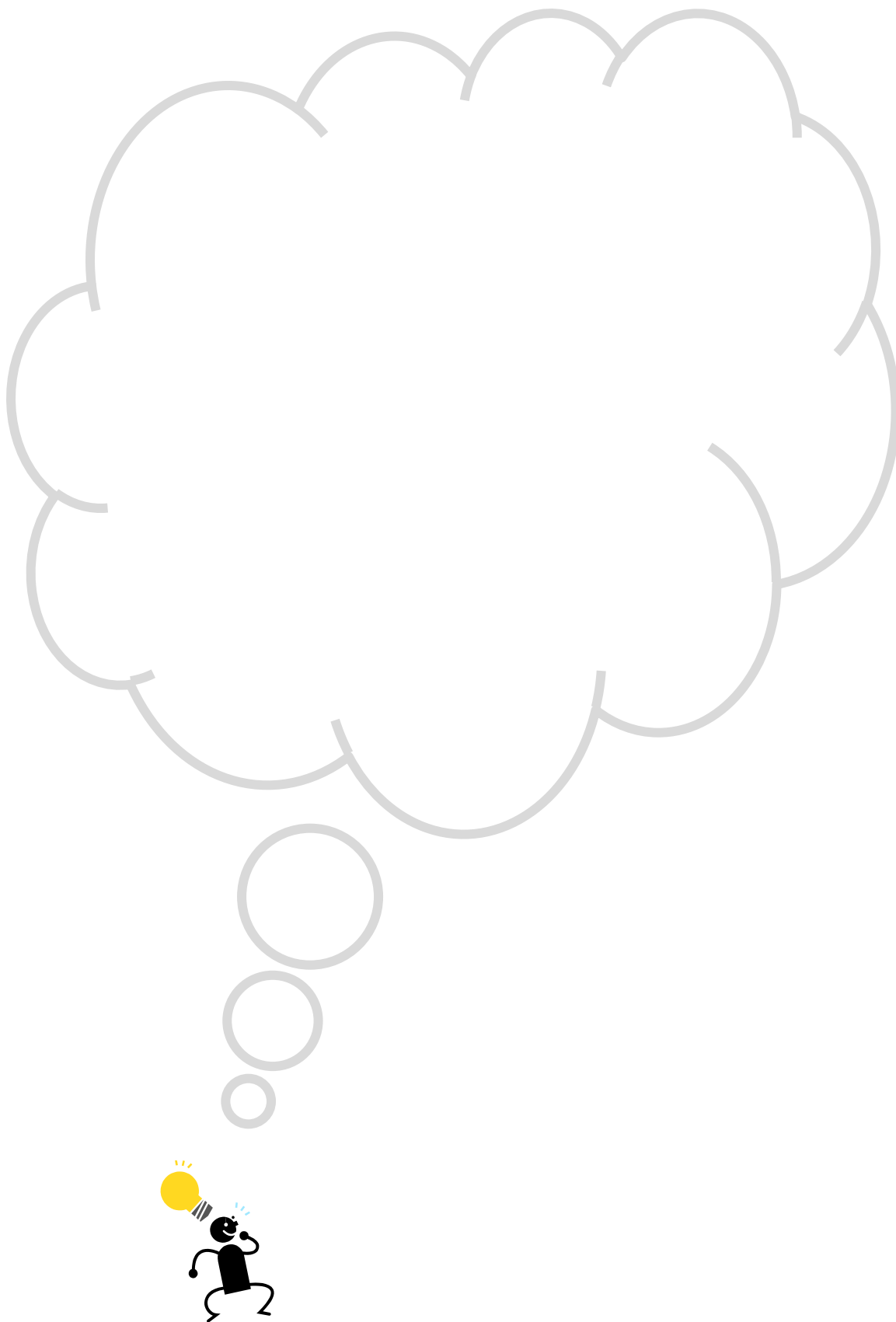




Mathematical Transformer: _____

Flipping, Turning, and Sliding





Mathematical Transformer: _____

Flipping, Turning, and Sliding Directions 1

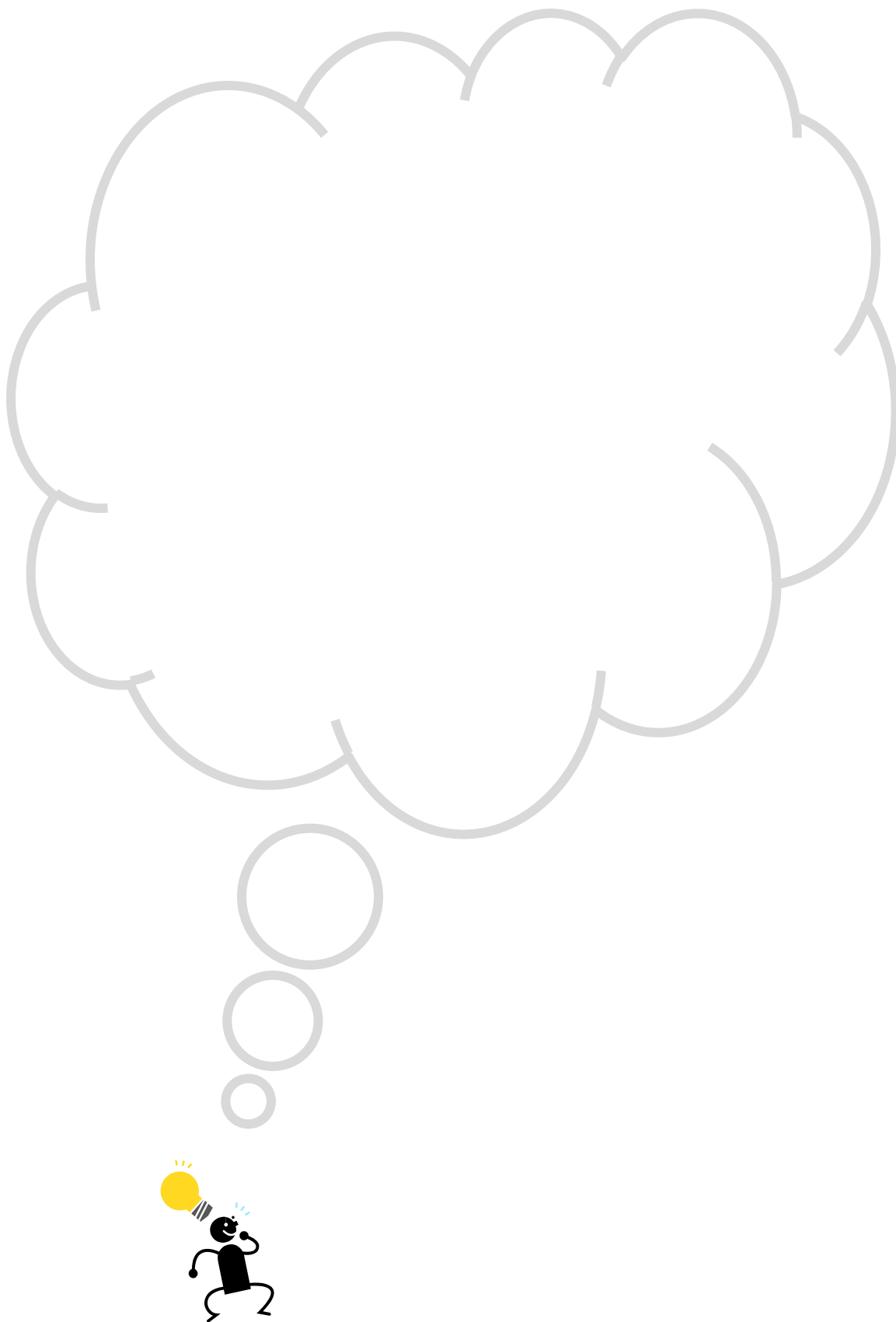
My directions from START to Triangle 4:

1. _____

2. _____

3. _____

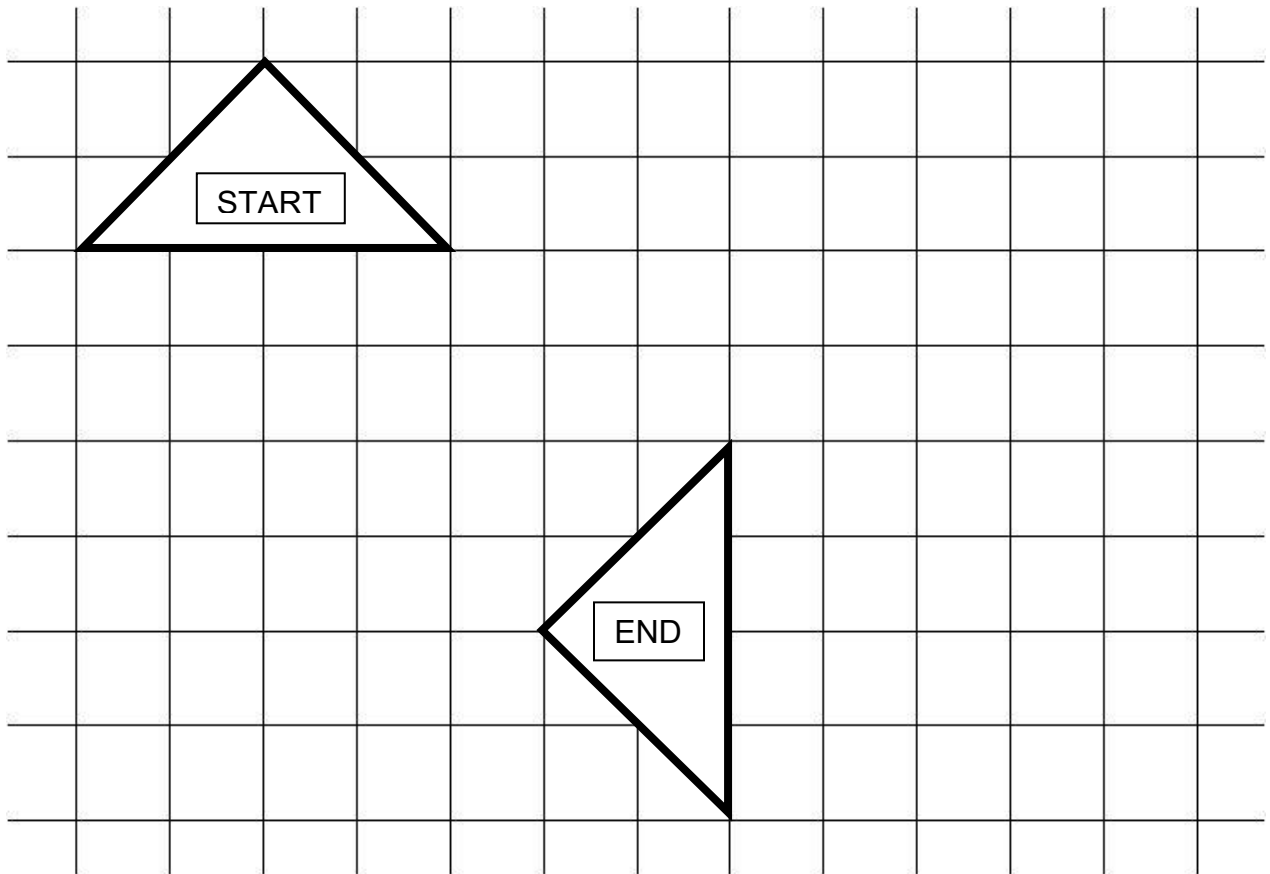
4. _____



Mathematical Transformer: _____

Flip, Turn, and Slide to the Finish

Can you find another way to get your triangle from START to END?
Write your directions using terms like FLIP, TURN, SLIDE, UP,
DOWN, LEFT, and RIGHT.





Mathematical Transformer: _____

Flipping, Turning, and Sliding Directions 2

My *different* directions from START to END:

1. _____

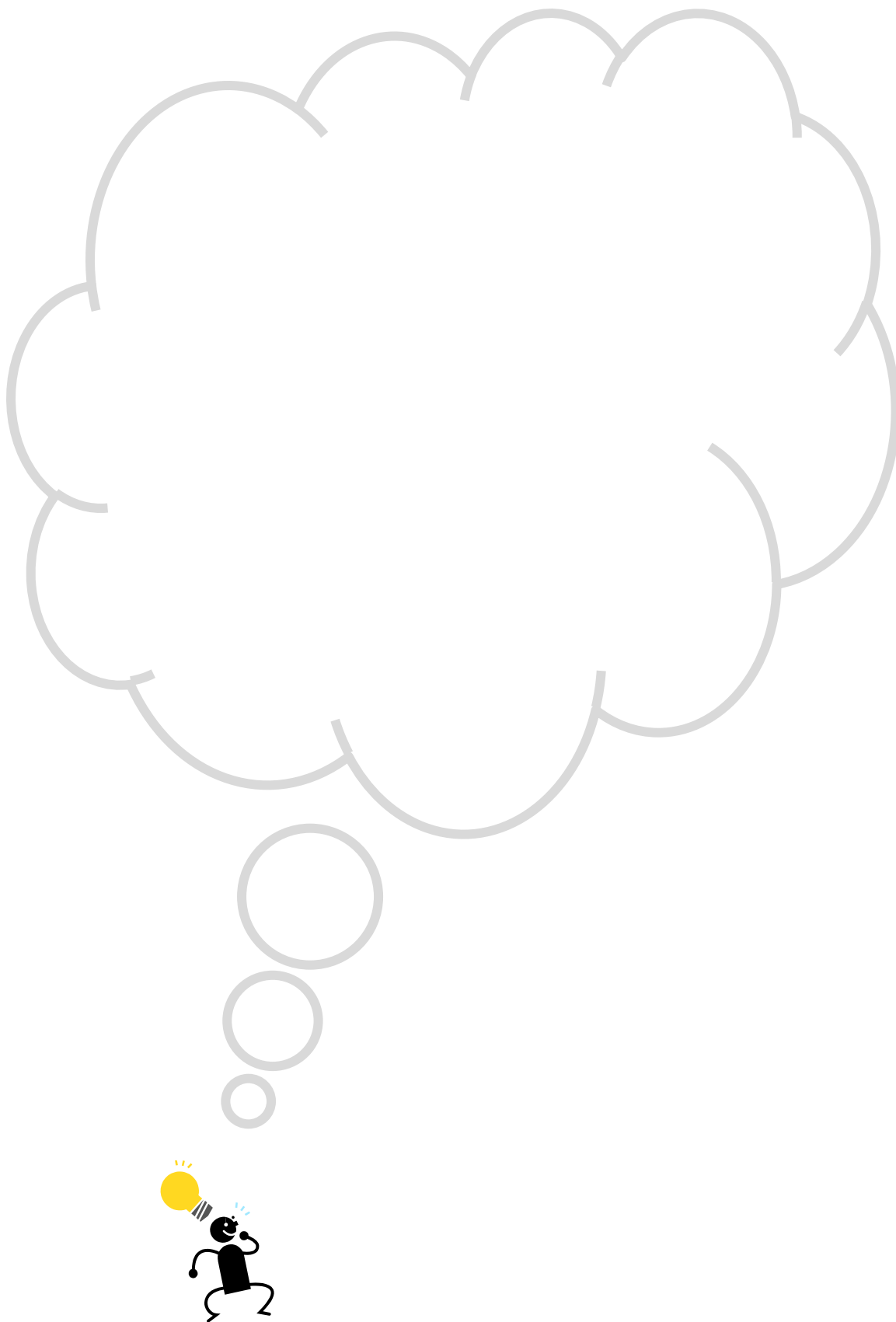
2. _____

3. _____

4. _____

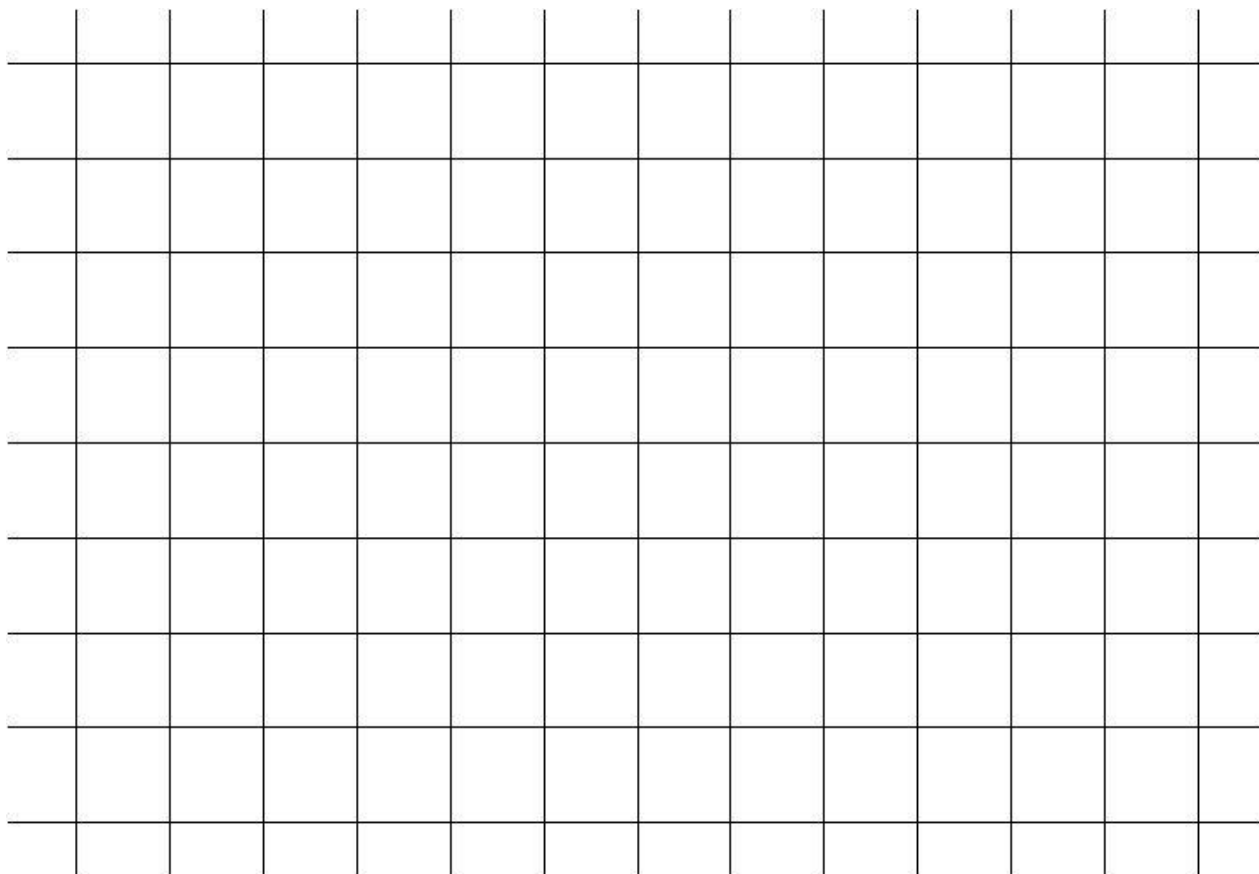
5. _____

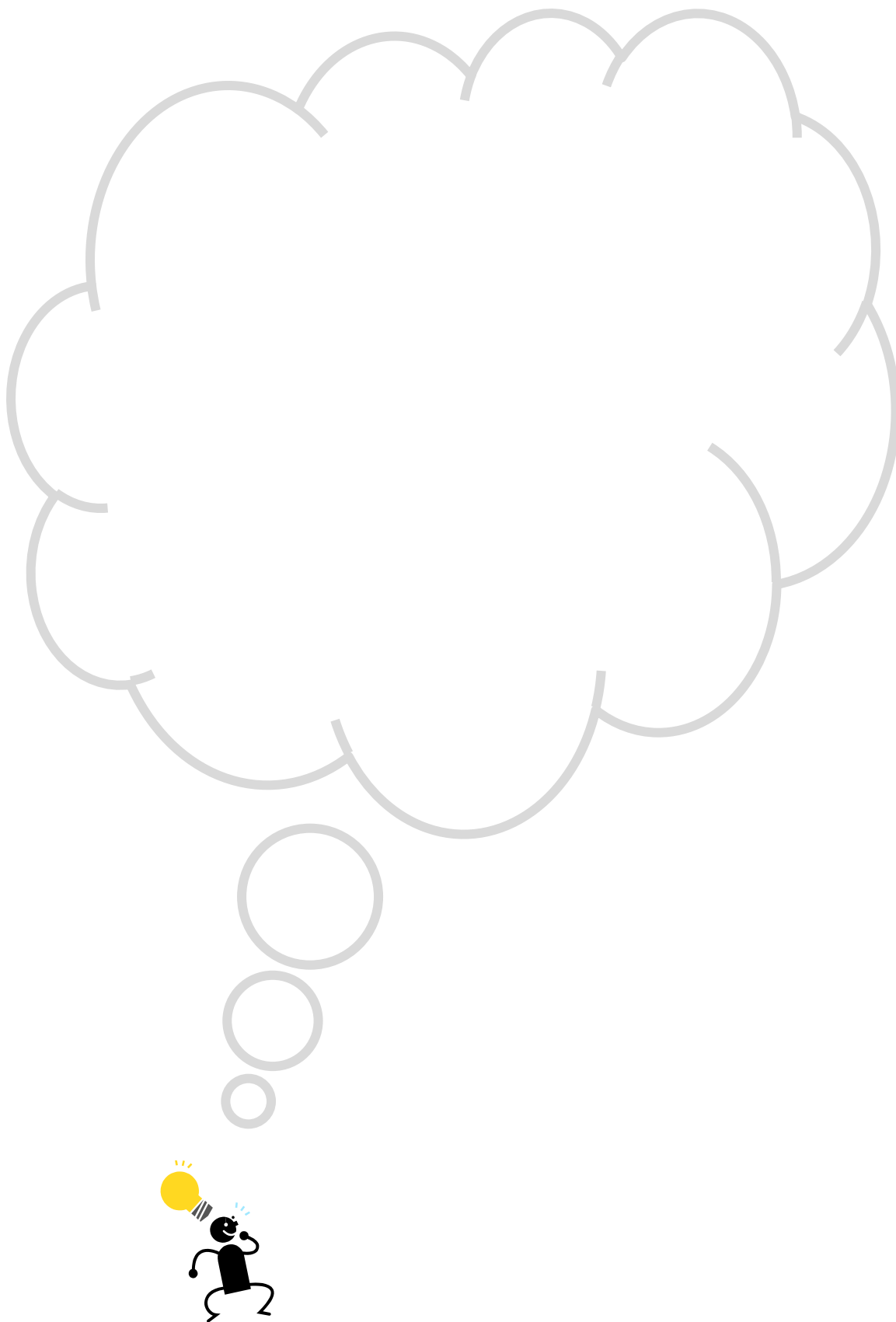
6. _____



Mathematical Transformer: _____

Create Your Own: Flip, Turn, Slide





Mathematical Transformer: _____

Flipping, Turning, and Sliding Directions 3

My *different* directions from START to END:

1. _____

2. _____

3. _____

4. _____

5. _____

6. _____



Height Changer: _____

One Inch Tall

One Inch Tall

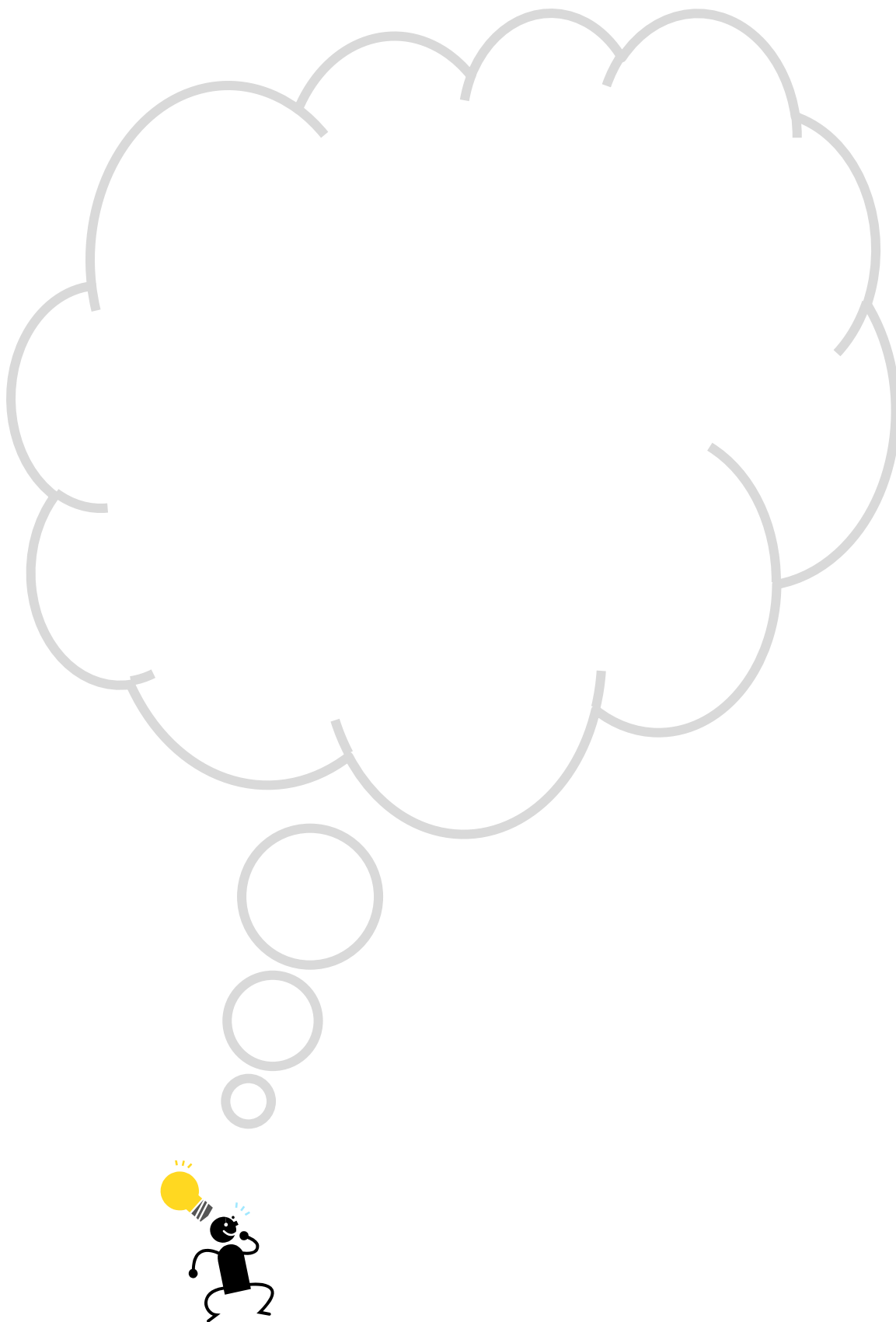
If you were only one inch tall, you'd ride a worm to school.
The teardrop of a crying ant would be your swimming pool.
A crumb of cake would be a feast
And last you seven days at least,
A flea would be a frightening beast
If you were one inch tall.

If you were only one inch tall, you'd walk beneath the door,
And it would take about a month to get down to the store.
A bit of fluff would be your bed,
You'd swing upon a spider's thread,
And wear a thimble on your head
If you were one inch tall.

You'd surf across the kitchen sink upon a stick of gum.
You couldn't hug your mama, you'd just have to hug her thumb.
You'd run from people's feet in fright,
To move a pen would take all night,
(This poem took fourteen years to write—
'Cause I'm just one inch tall).

Shel Silverstein

Silverstein, S. (1974). *Where the sidewalk ends*. New York, NY: HarperCollins.



1. Draw a vertical segment that is one inch long. Next to that segment, draw a one-inch tall person.

2. Would a one-inch tall person fit under the door of your classroom? Explain why or why not.

3. Choose one other line from the poem. Explain whether or not the line makes sense for a one-inch tall person.

4. Draw a person who is only $\frac{1}{2}$ inch tall.



Height Adjuster: _____

If I Were ____ Tall

Under each measurement, draw a person with the given height.

2 inches	3 1/2 inches	5 inches
		

Choose one of the people you drew above and write a poem about what life is like for that person.

[illegible]

Height Adjuster: _____

If I Were _____ Tall

Under each measurement, draw a person with the given height.

2 1/2 inches	3 1/4 inches	4 3/4 inches

Choose one of the people you drew above and write a poem about what life is like for that person.

[illegible]

Segment Adder: _____

Segment Addition

Recall: A **line segment** is a part of a line with two endpoints.



The **Segment Addition Postulate** says that if you add two pieces of a segment, you can find the length of the whole segment.

EXAMPLE: Combine a 1 inch segment and a 2 inch segment.



What is the length of the whole segment? $\underline{1 \text{ inch}} + \underline{2 \text{ inches}} = \underline{3 \text{ inches}}$

-
1. Combine a 2 inch segment and a 3 inch segment.

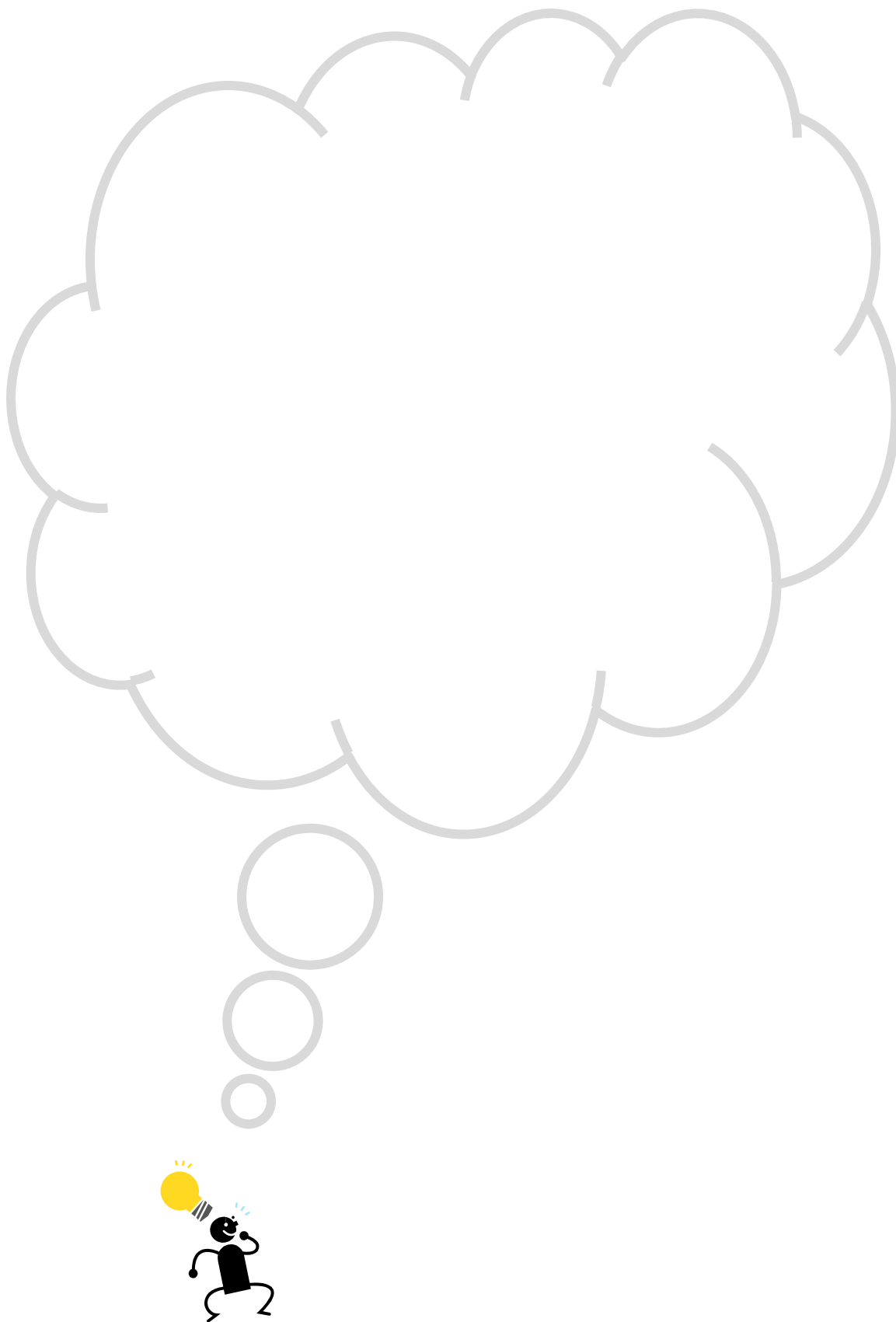
What is the length of the whole segment? _____

2. Combine a 2 inch segment and another 2 inch segment.

What is the length of the whole segment? _____

3. Combine a 2 $\frac{1}{2}$ inch segment and a 3 $\frac{1}{2}$ inch segment.

What is the length of the whole segment? _____
(Hint: Measure the length if you cannot find it by adding!)



Fractioneers: _____

Fractional Paths

Follow the steps below.

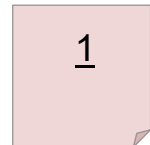
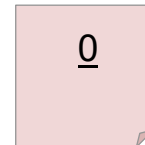
1. The WALKER starts on the mark labeled “HOME.”
2. The WALKER counts each mark from HOME to SCHOOL.
3. The RECORDER records the number of marks counted.

Remember
to count the
HOME mark
as “zero.”

Number of marks counted: _____

4. The WALKER walks along the path again. The whole group counts the marks starting with zero.
5. Put a sticky note on each of the marks along your path.

6. At the top of each sticky note, write the number for that mark. Underline the number. This is called the **numerator** of your fraction.

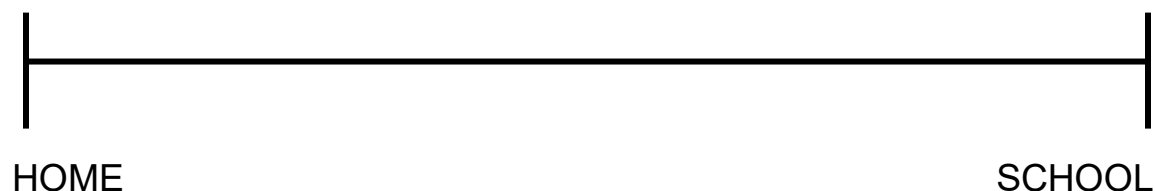


7. Under the **numerator**, write the **denominator**. This is the total number of marks counted from question 3. The **denominator** is the same for all of your fractions.

BE THE EXPERT: Why is the denominator the same for all of the fractions?



8. Finish the picture below so that it looks like your path. Write the correct fraction above each mark in the picture.



9. Choose FOUR of the fractions from your path and write them in the first column. Then tell how to say each fraction and what it means. An example is given to help you.

FRACTION	HOW I SAY IT	WHAT IT MEANS
EXAMPLE: $\frac{3}{8}$	Three-eighths	The third mark out of eight

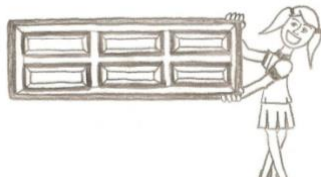
10. Write five questions to ask another group, about your group's fractional path.

Shape Evaluator: _____

What If...

Problem 1: Your teacher tells the class that she is going to give each student a candy bar.

What if your teacher gave all the girls in class 1 of these?



Then, all of the boys in class got 1 of these.



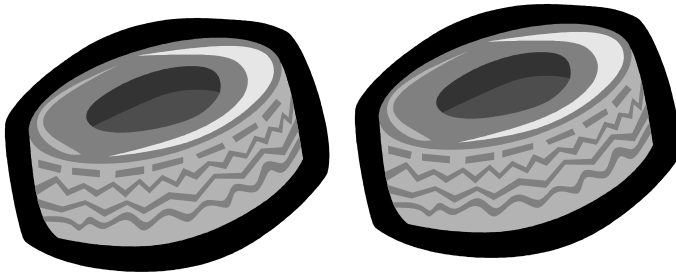
a. Explain why the teacher is being unfair.

b. What should the teacher do to make it fair?

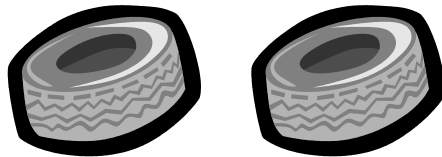


Problem 2: Andrea's mom just bought a new car and she got a really good deal.

The two tires on one side of the car looked like this:



The two tires on the other side of the car looked like this:



a. What is wrong with the tires on the new car?

b. What should Andrea's mom do to fix the car?

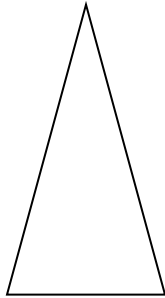


Problem 3: Tyrell is helping his father install the new door they bought.

The empty space where the door goes looks like this:

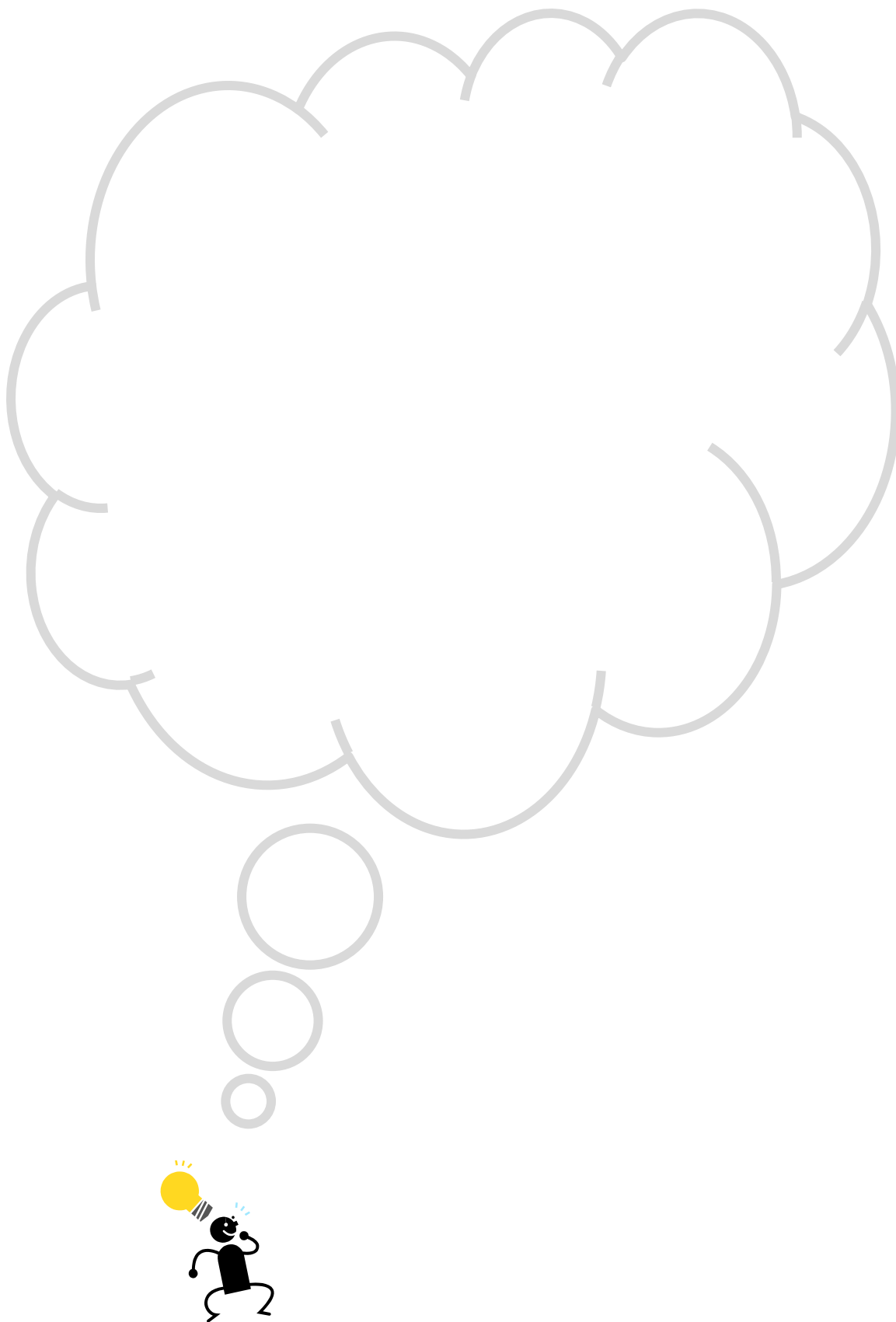


The new door looks like this:



a. Explain what is wrong with the door they bought.

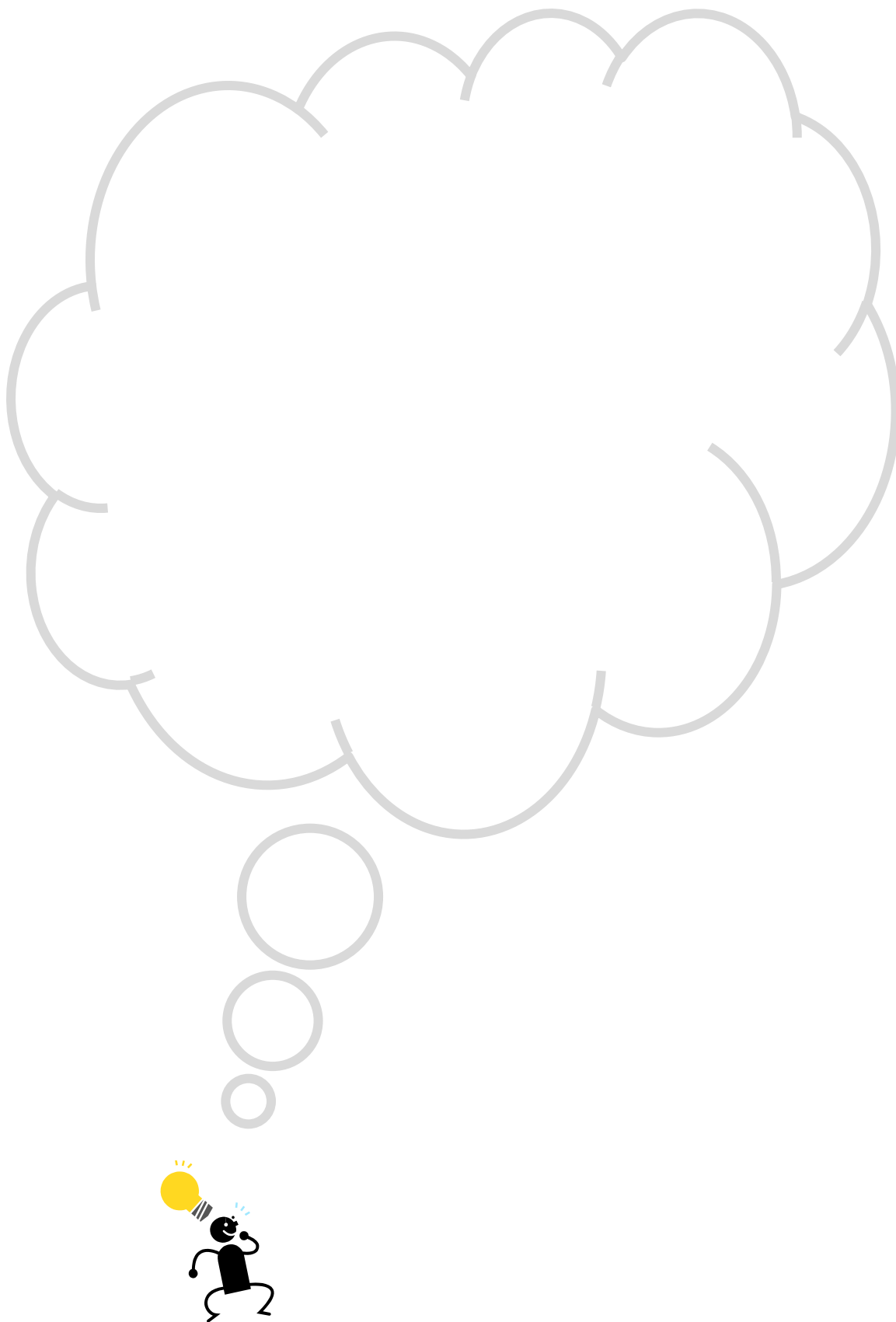
b. What should they do before they go to buy another door?



Problem 4: DESIGN TEAM TIME: Making a new human.
Make a list of body parts that come in 2s.

a. LIST: We all have 2...

- b. THINK about which of the body parts you listed are supposed to be the same size and shape.
- c. DRAW a person making the body parts you listed different sizes, different shapes, or both.
- d. WRITE a story about why life is harder for the person you drew.



Body Builder: _____

It Depends on the Number of Humans

For each problem below, write the number of body parts for the given number of humans. Then, write the multiplication problem you can use to figure out the total number of body parts for the given number of humans.

EXAMPLE: If I see 3 humans, then I see 3 noses, 6 eyes, and 30 fingers.

Multiplication problems:



Noses 3 humans x 1 nose each = 3 noses all together



Eyes 3 humans x 2 eyes each = 6 eyes all together

Fingers 3 humans x 10 fingers each = 30 fingers all together



1. If I see 5 humans, then I see ____ eyebrows, ____ tongues, and ____ toes.

Multiplication Problems:



Eyebrows ____ humans x ____ eyebrows each = ____ eyebrows all together



Tongues ____ humans x ____ tongue each = ____ tongues all together



Toes ____ humans x ____ toes each = ____ toes all together



2. If I see 7 humans, then I see ____ knees, ____ elbows, and ____ nails (fingers and toes).

Multiplication Problems:



Knees ____ humans x ____ knees each = ____ knees all together



Elbows ____ humans x ____ elbows each = ____ elbows all together



Nails ____ humans x ____ nails each = ____ nails all together

3. If I see 4 humans, then I know that they have ____ heart chambers, about ____ teeth, and about ____ bones.

(HINT: Each human has 4 heart chambers, about 28 teeth, and about 208 bones.)

Multiplication Problems



Heart Chambers ____ humans x ____ heart chambers each = ____ heart chambers all together

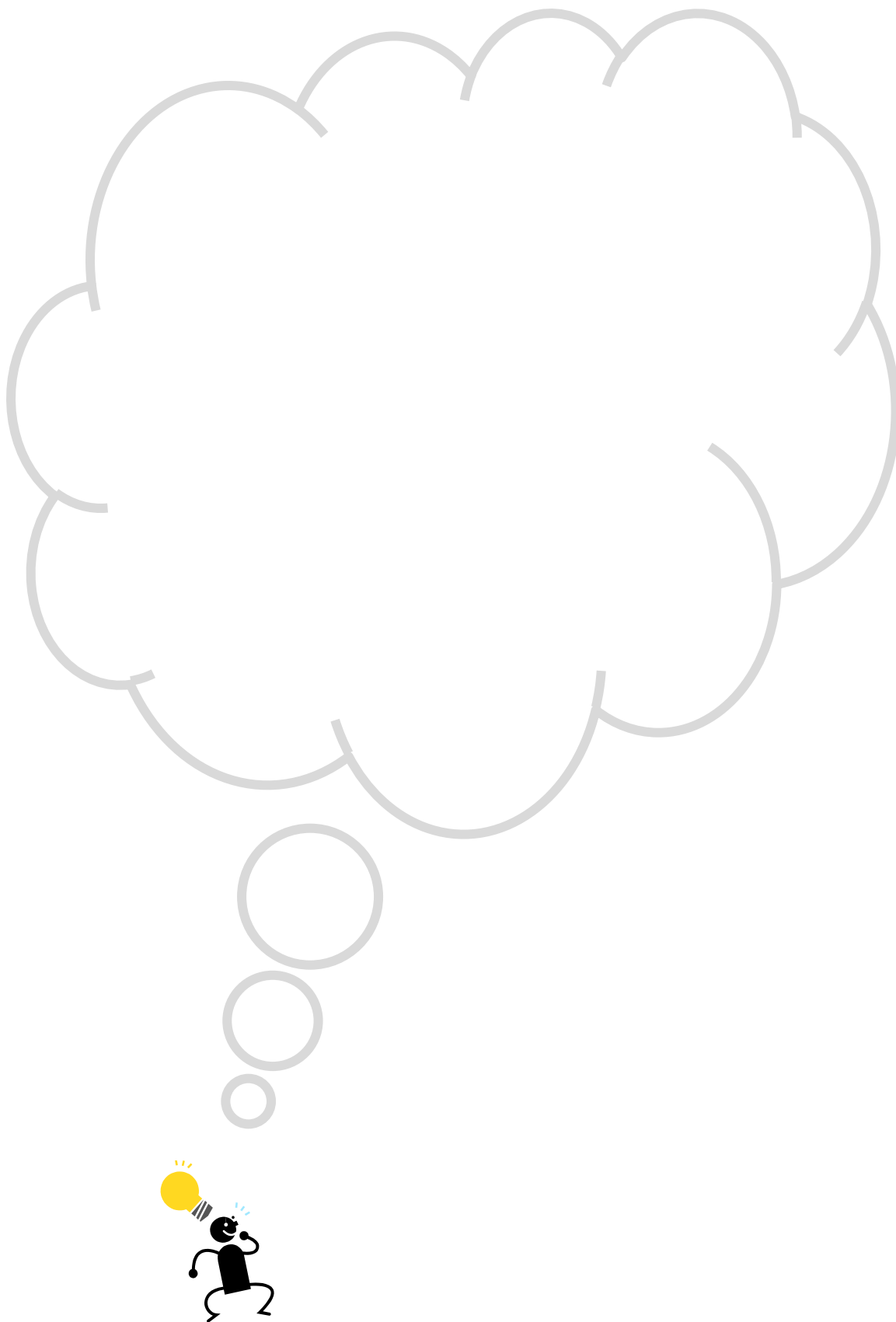


Teeth ____ humans x ____ teeth each = ____ teeth all together



Bones ____ humans x ____ bones each = ____ bones all together

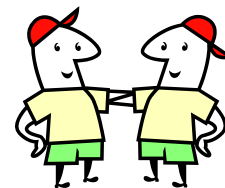
Why do you think the term “about” must be used when talking about teeth and bones?





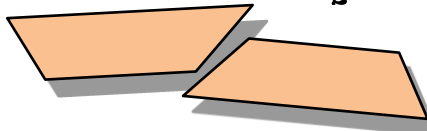
Size-Shape Specialist: _____

Are You My Twin?



1. Let's define "congruent figures."

CONGRUENT FIGURES:

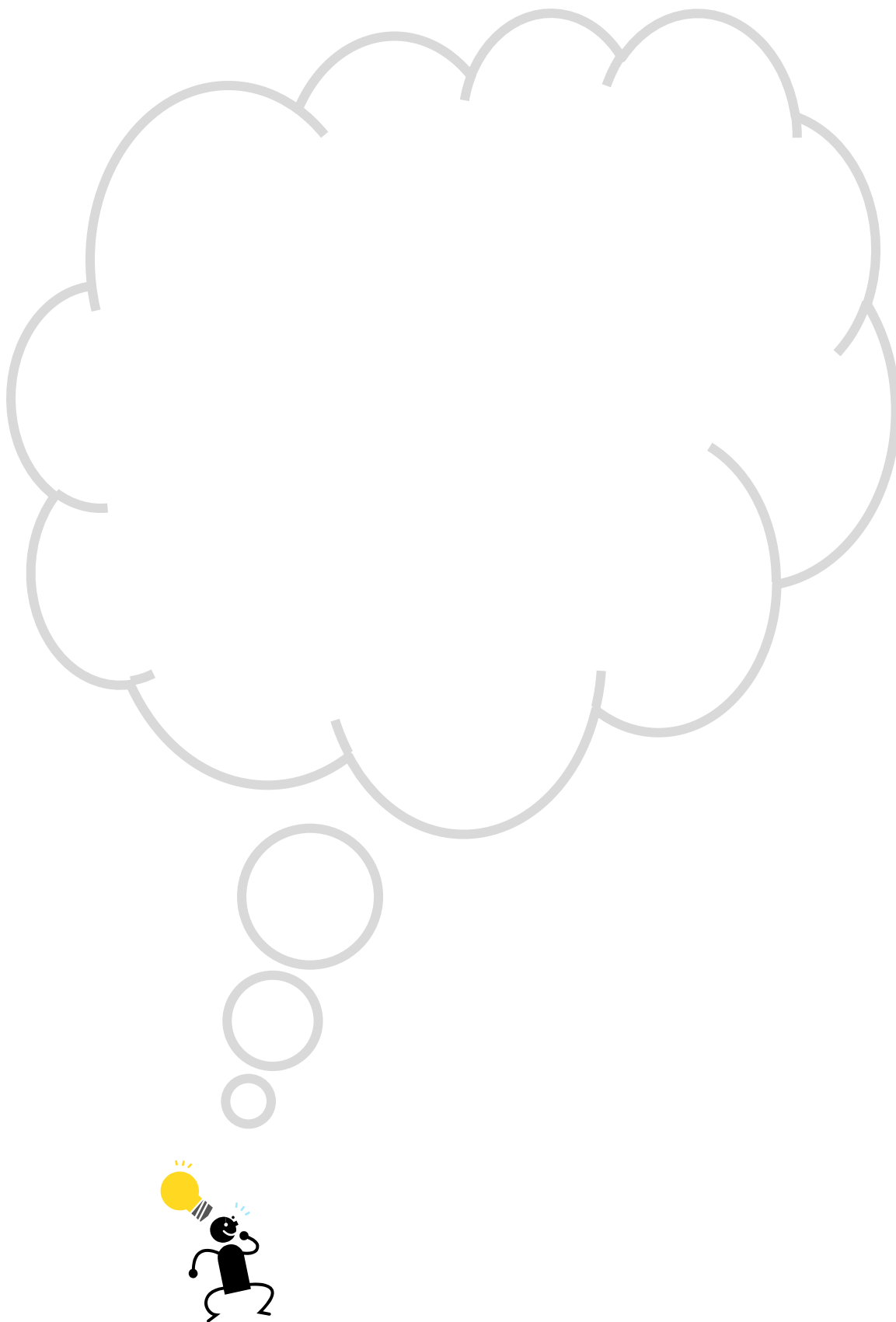


2. Do the triangles you and your partner made look the same?

3. Look at the third side that you drew. Which triangle has a LONGER third side, ACUTE or OBTUSE?

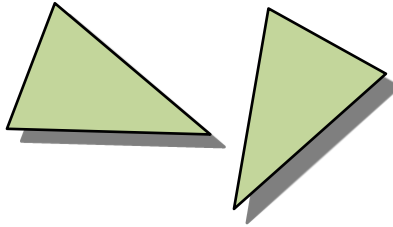
4. Are the two triangles CONGRUENT FIGURES? Why or why not?

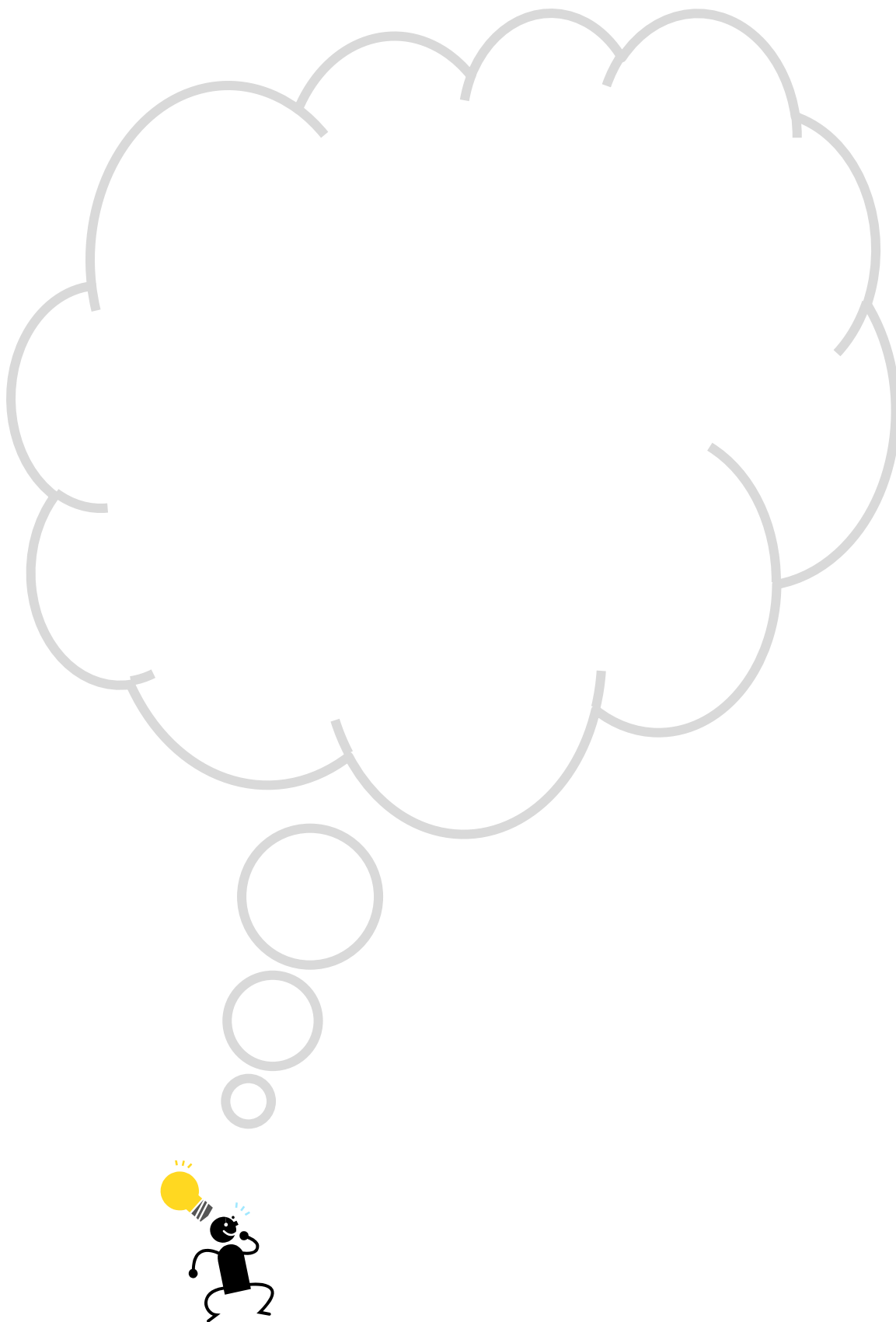
5. COMPARE your acute triangle to the acute triangle of another group. Are they CONGRUENT FIGURES? Why or why not?



6. COMPARE your obtuse triangle to the obtuse triangle of another group. Are they CONGRUENT FIGURES? Why or why not?

7. Give directions for making two triangles that are CONGRUENT FIGURES.



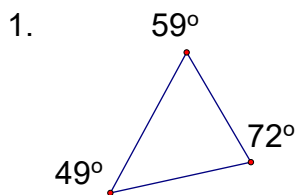


Triangler: _____

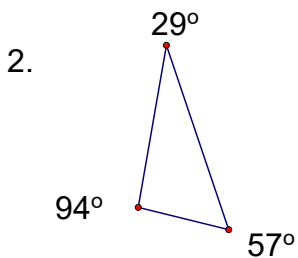
Triangle Sum Theorem

In Geometry, a **theorem** is something that can be proven. One theorem is called the **Triangle Sum Theorem**.

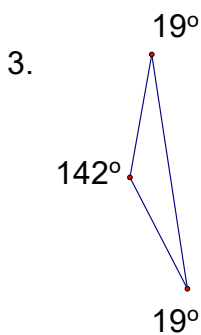
ADD THE 3 ANGLES in each triangle then predict what you think that theorem might say.



Your Work:

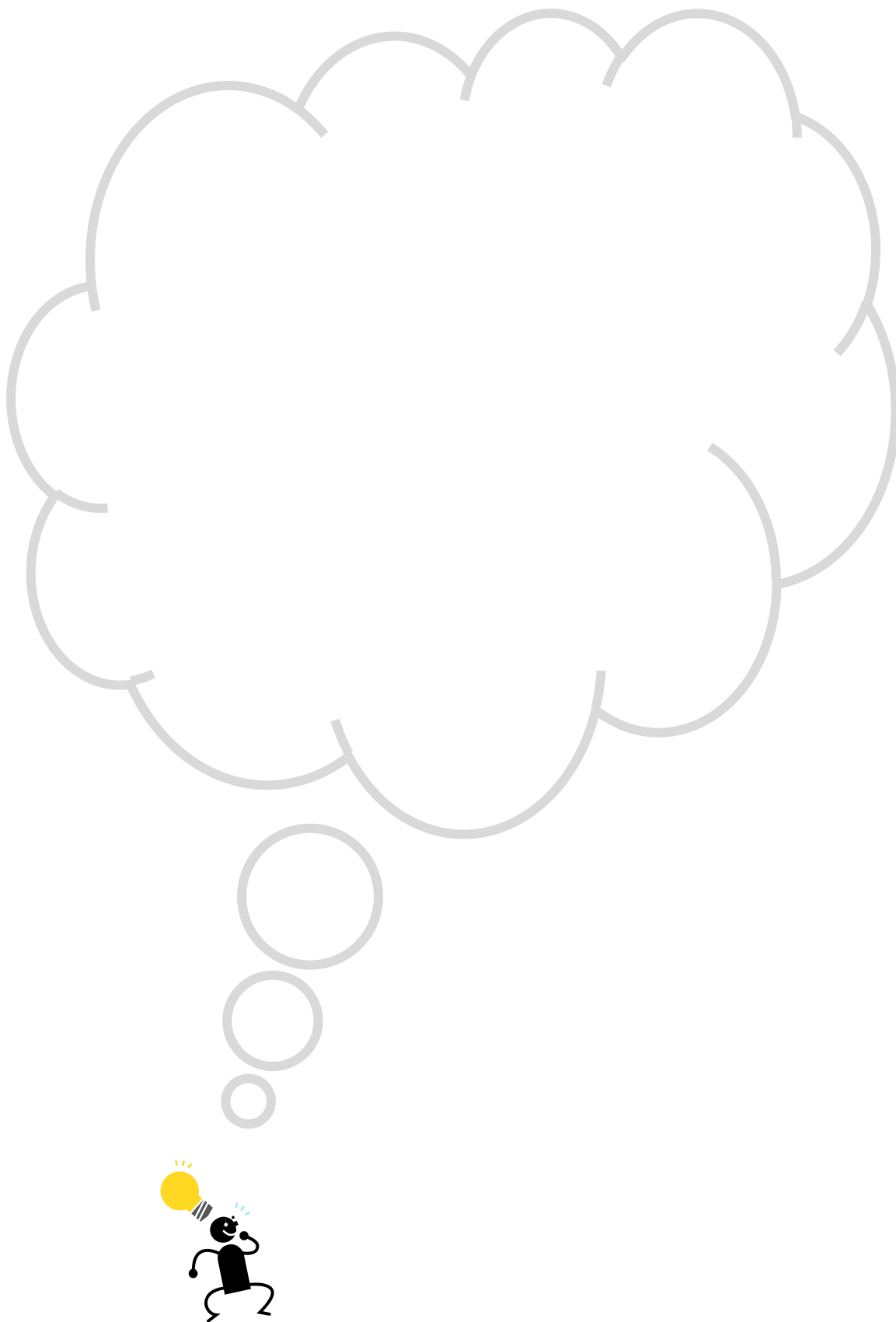


Your Work:



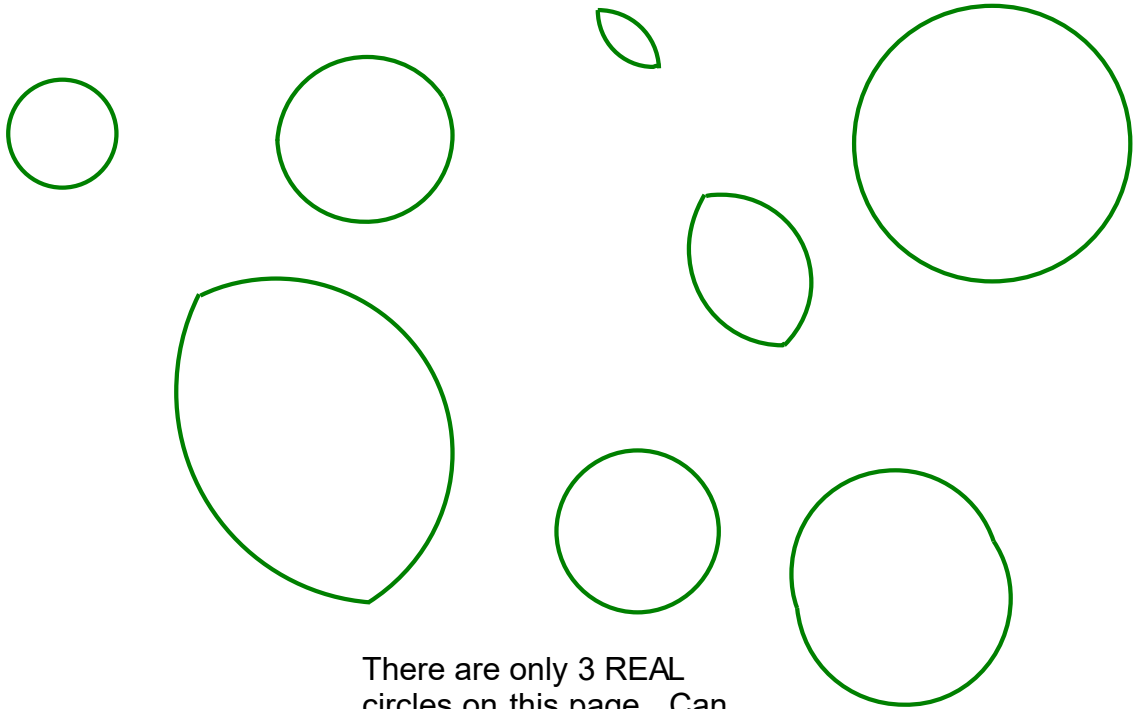
Your Work:

4. What do you think the Triangle Sum Theorem says about the sum of the three angles in a triangle?



Circle Spotter: _____

Spot the Impostors



There are only 3 REAL
circles on this page. Can
you spot the impostors?

Color the 3 circles.

Explain how you were able to tell which shapes were NOT circles.

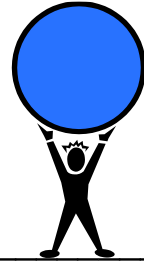


Inventors: _____

Making a Circle My Way

Develop a way to make a perfect circle using the materials provided.
Write instructions for how to make a circle the way you invented.

HOW TO MAKE A PERFECT CIRCLE:



1. _____



2. _____



3. _____



4. _____





Inventors: _____

Three Methods for Making a Circle

There are three different methods for making a circle below. Test each method and decide which works the best.

Method #1

1. Draw a point in the middle of a blank piece of paper.
2. Place a toothpick so that one end touches the point.
3. Make another point at the other end of the toothpick.
4. Rotate the toothpick a little bit and make another point.
5. Continue rotating and making more points until you can draw your circle.

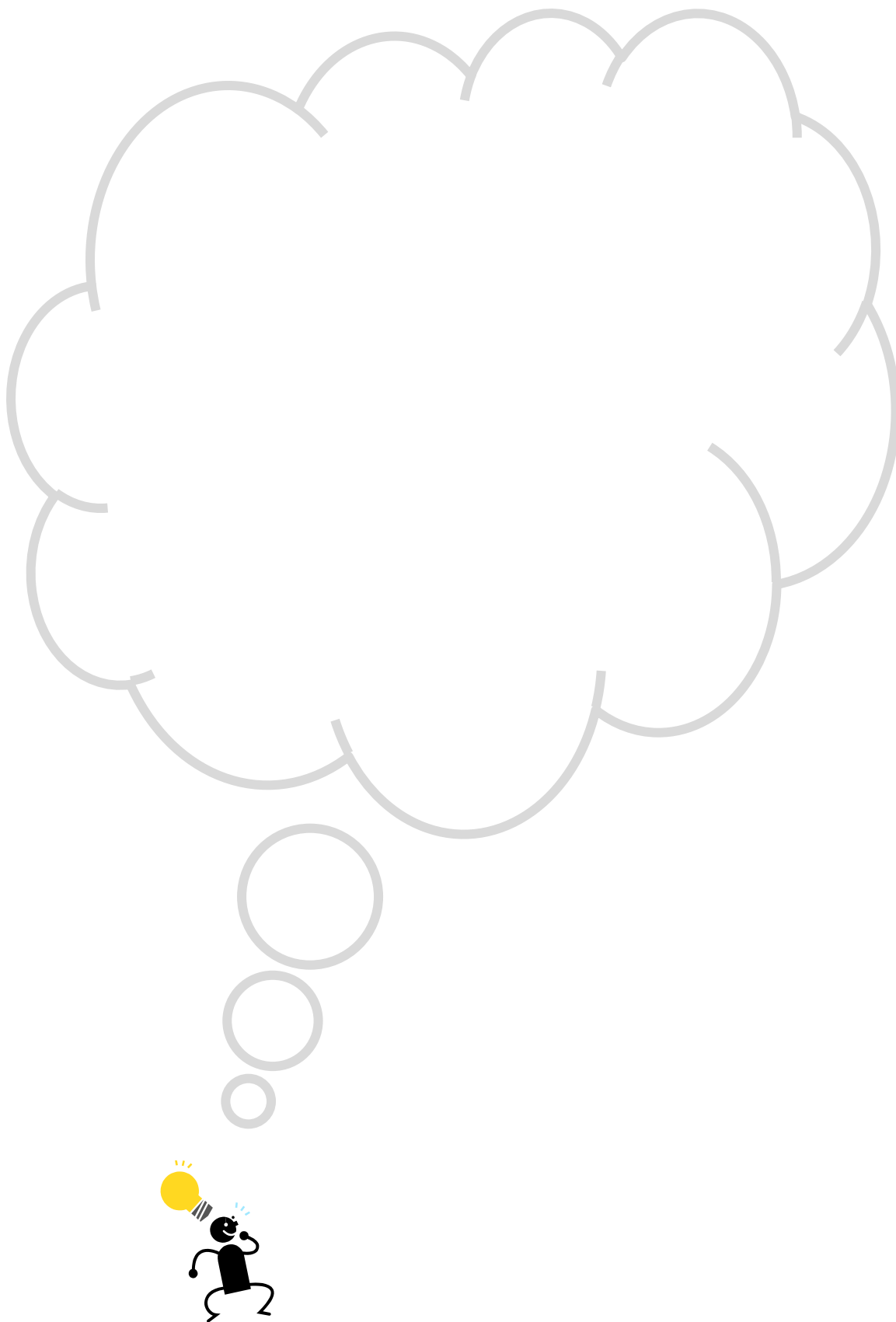
Method #2

1. Put one pencil through a rubber band so that the point is in the middle of a piece of paper.
2. Put another pencil at the other end of the rubber band with its point also on the paper.
3. Ask a partner to turn the paper while you hold the pencils steady.

Method #3

1. Use the same method you used for the rubber band, but this time use a PAPER CLIP.

Which method do you think made the best circle? Explain your thinking.



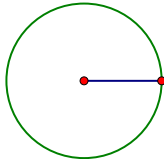
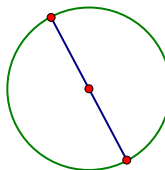
Diameter Detector: _____

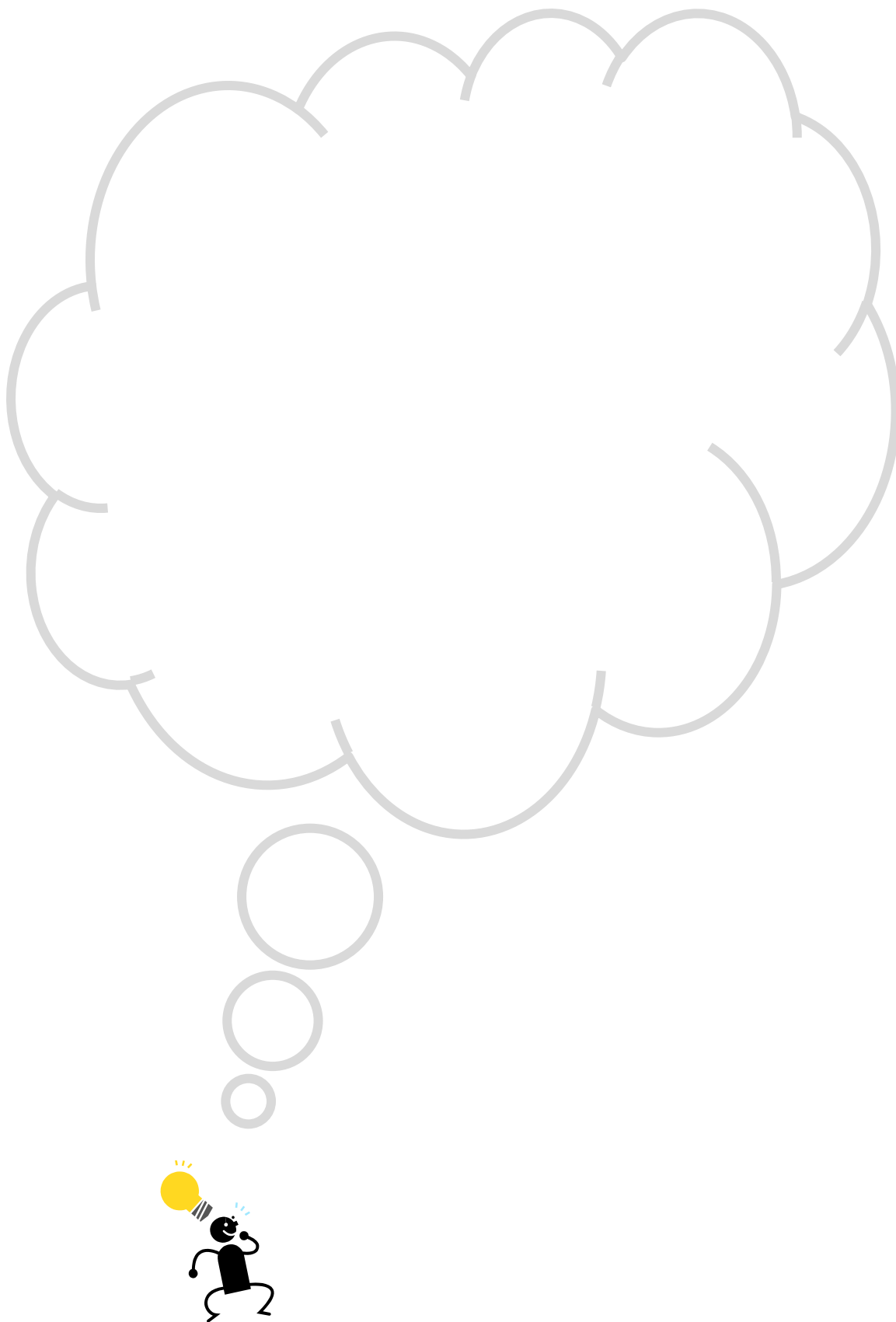


From Radius to Diameter and Back Again

A circle has special parts called the Radius and the Diameter. Use patterns to help you complete the table below.

Circle A shows a line segment that is the radius. Circle B shows a line segment that is the diameter.

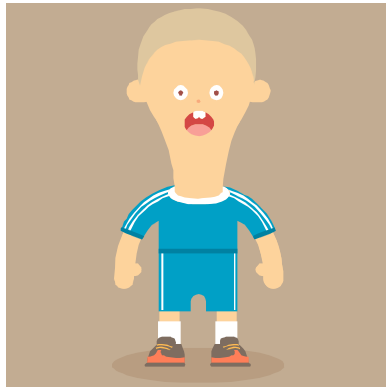
A circle with radius...	Has diameter...	Circle A Circle B  
1 inch	2 inches	
2 inches	4 inches	Questions - Find the diameter of a circle with radius 24 inches. - Find the radius of a circle with diameter 100 inches.
3 inches	6 inches	
4 inches	_____ inches	
5 inches	_____ inches	
_____ inches	12 inches	
7 inches	_____ inches	
_____ inches	_____ inches	
_____ inches	_____ inches	

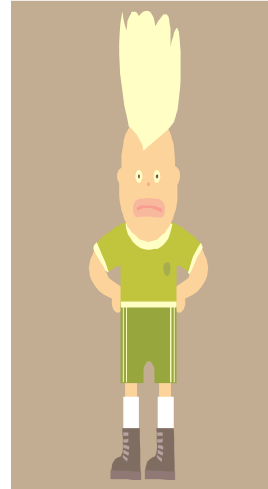


Name: _____ Date: _____

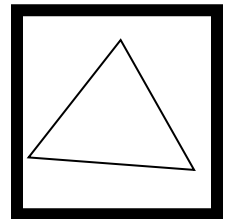
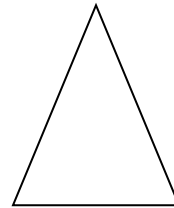
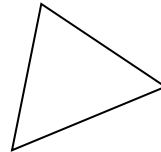
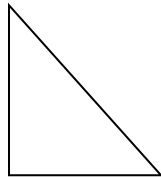
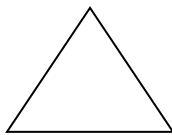
Check Up #2

1. Measure the height of each person in inches. Record your answer below.

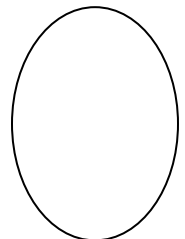


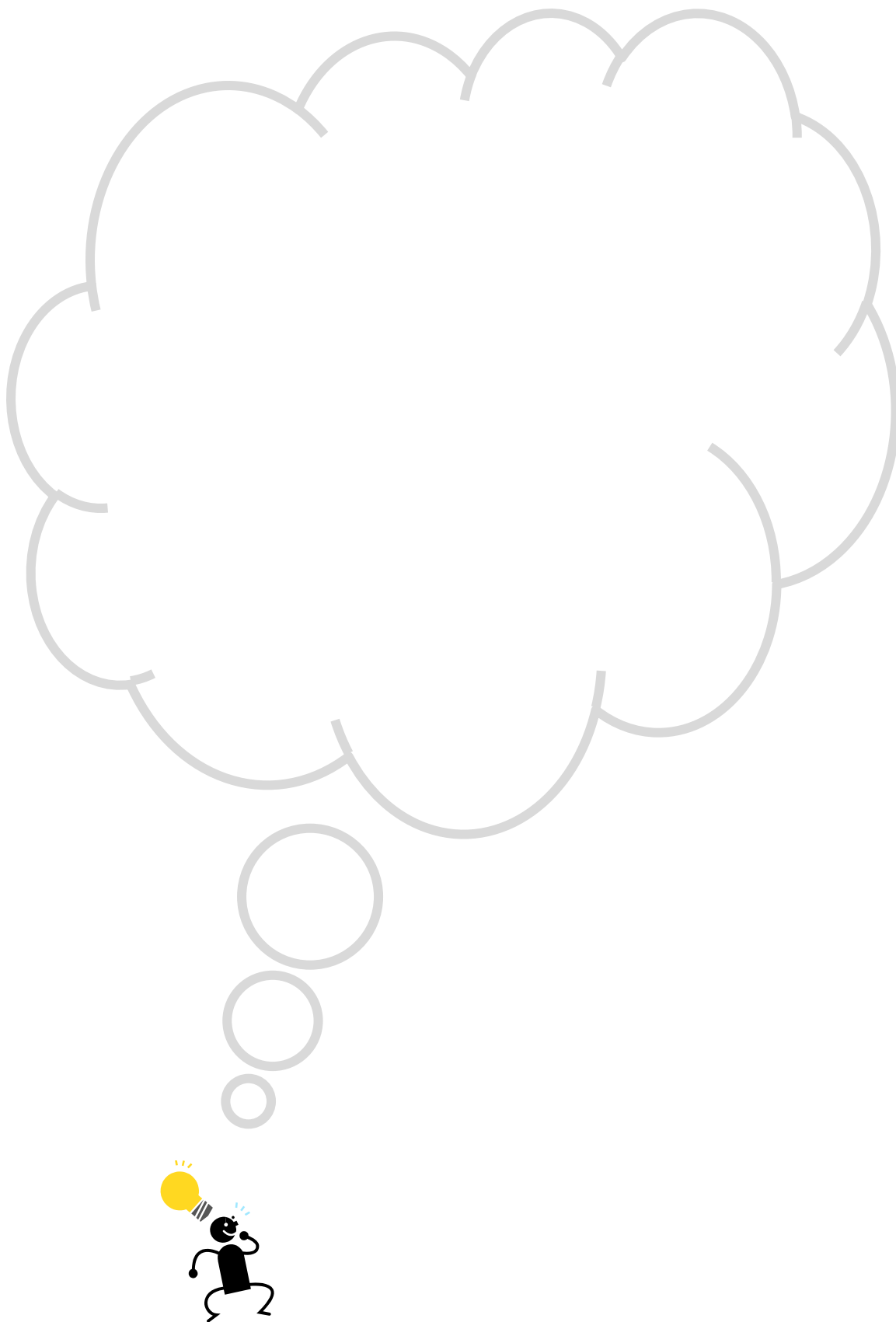


2. Circle the triangles that are congruent to the triangle in the box.

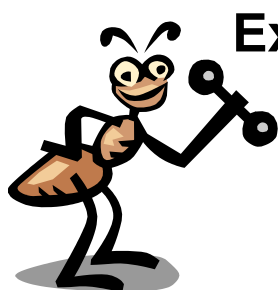


3. Explain how you know the picture IS NOT a perfect circle.





Ant Coach: _____

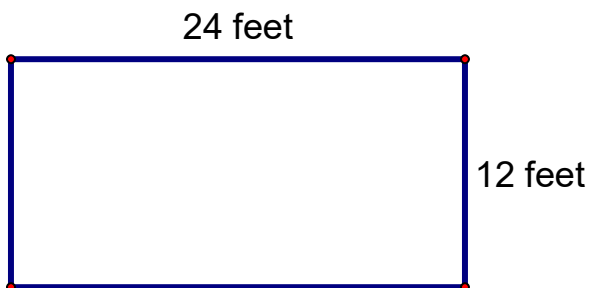


Exercising Ants



Task 1

Annie the ant wants to start exercising. She decides to do one lap around the rectangular pool each day.



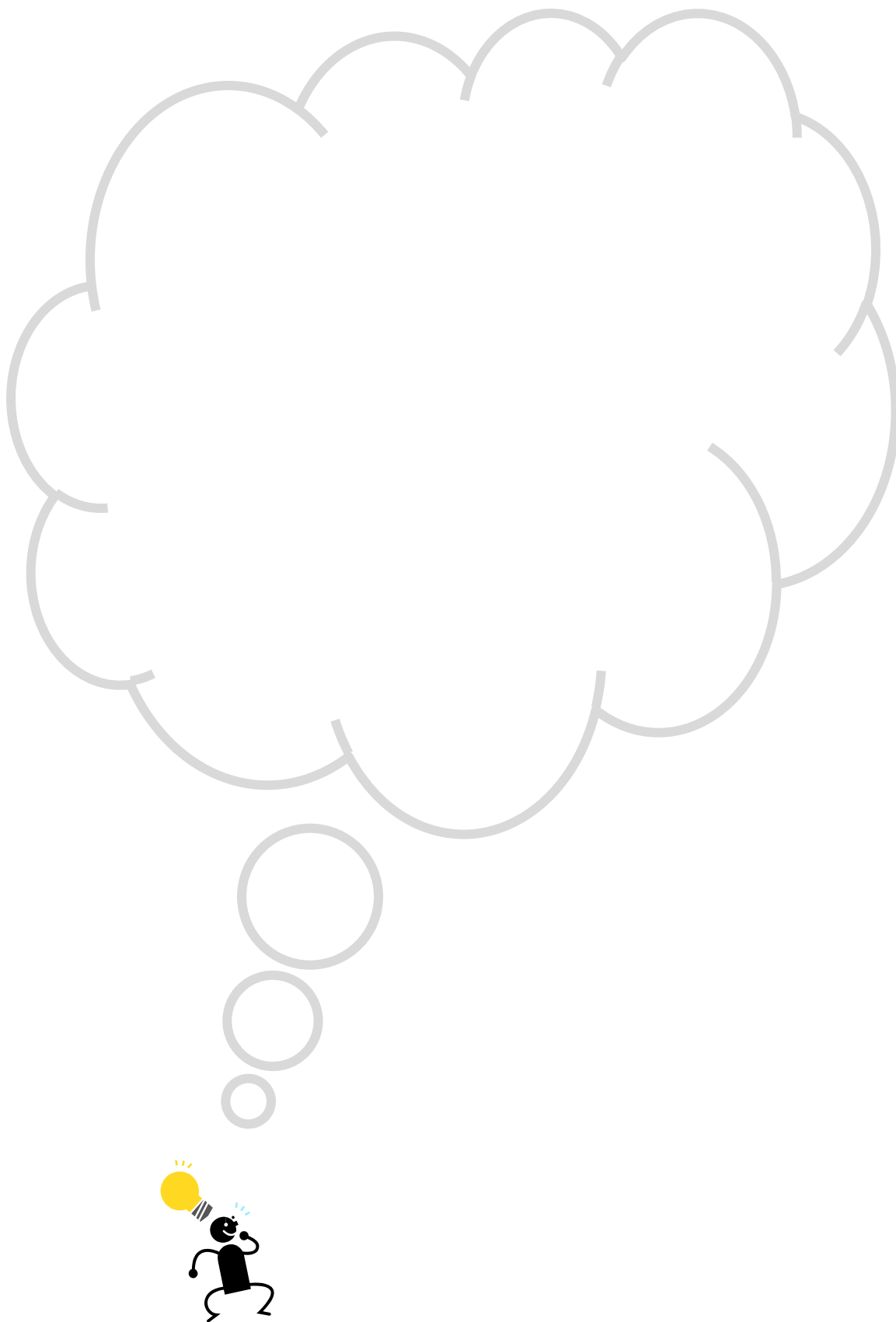
How many feet will Annie walk if she goes all the way around the edge of the pool? Explain your answer.

Task 2

Annie's brother, Arthur Ant, decides that he, too, will start exercising. He decides to walk around the pool twice. How many feet does he walk?

(Hint: Use your answer from Task 1 to help you.)





Task 3

Angela Ant brags that she walked around the pool many times and went 360 feet, but she forgot how many times she went around. Help Angela figure out how many laps she did. Show your work below.

1 time around the pool is _____ feet.

2 times around the pool is _____ feet.

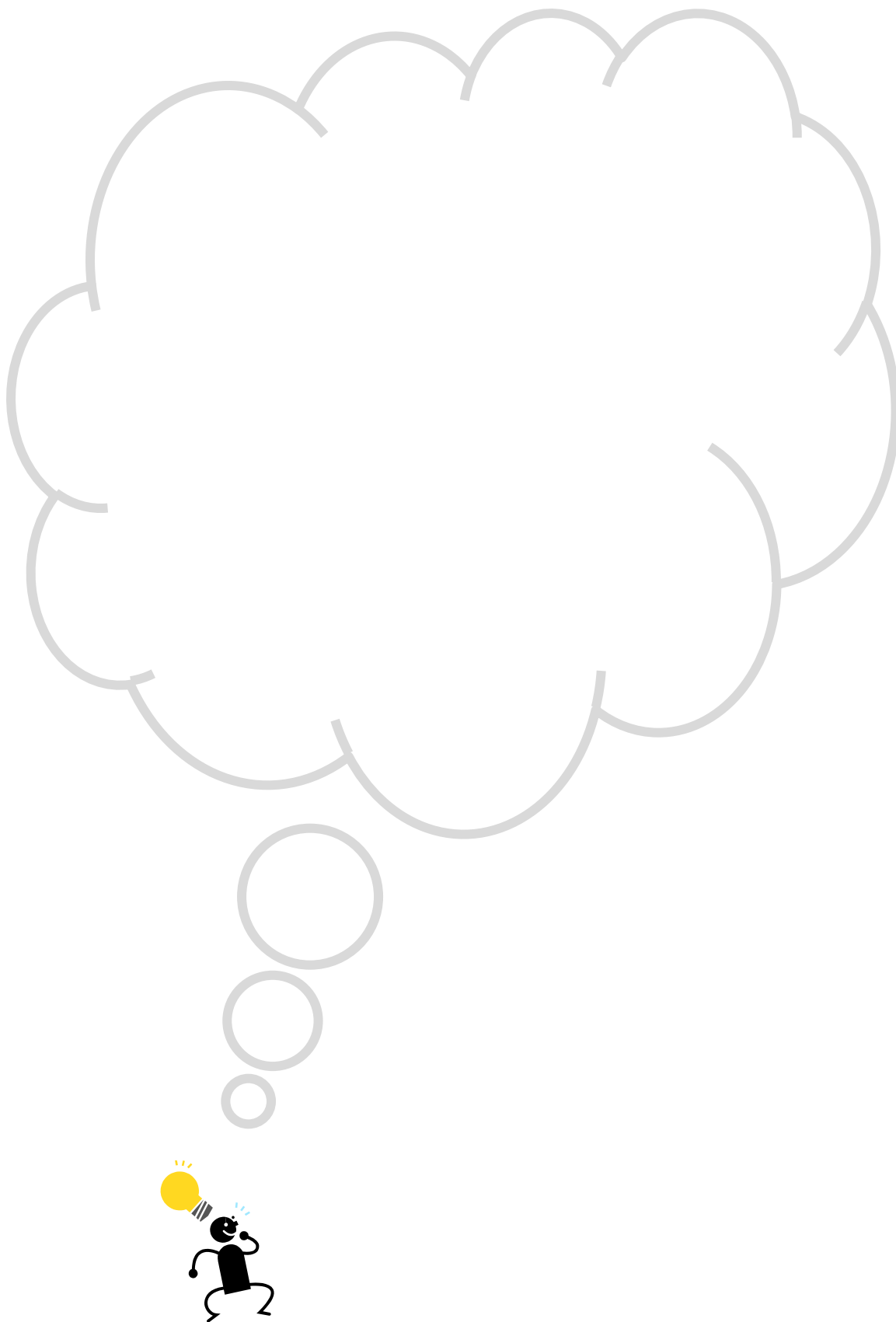
3 times around the pool is _____ feet.

4 times around the pool is _____ feet.

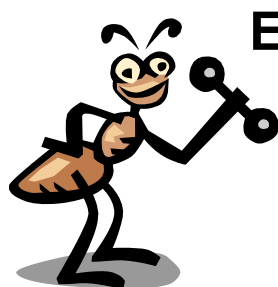
5 times around the pool is _____ feet.

6 times around the pool is _____ feet.

Using the information above, I can tell that Angela went around the pool _____ times.



Ant Coach: _____

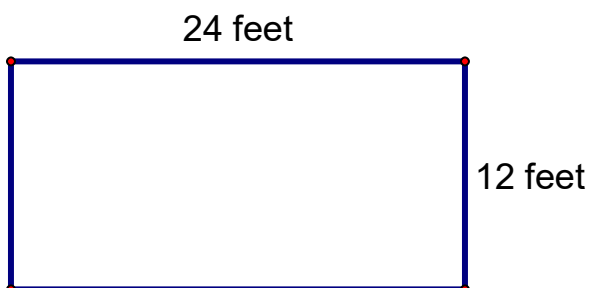


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Challenge Task

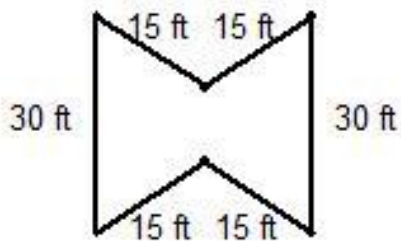
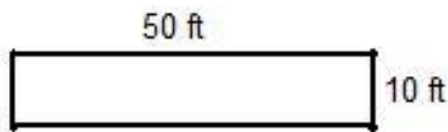
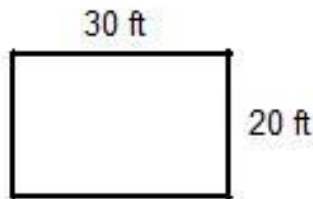
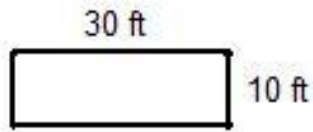
If Annie can walk 3 feet in 1 minute, how many minutes will it take her to get around the pool one time? Explain your answer.



Distance Diver: _____

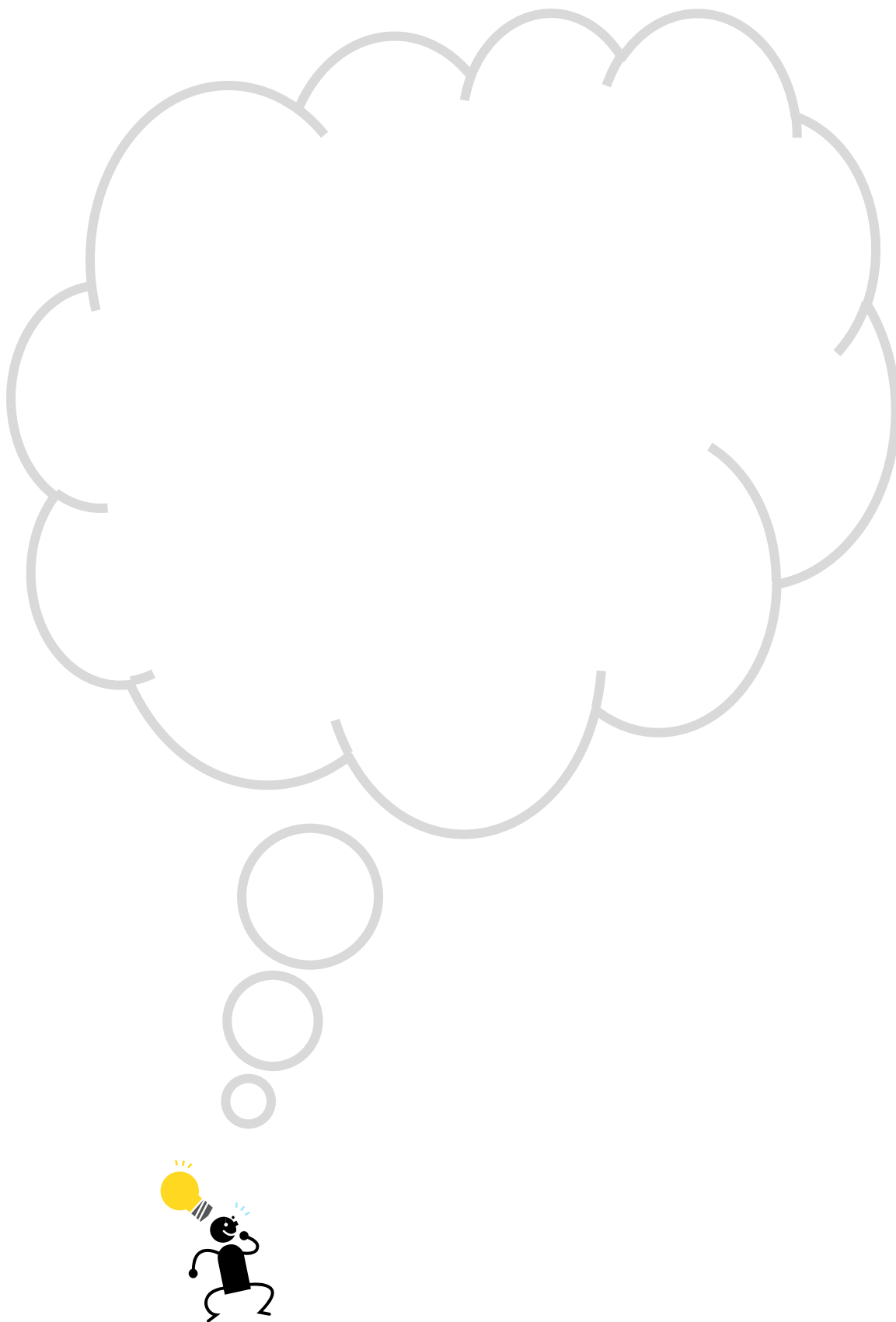
Which Pool Has the Biggest Perimeter?

Directions: Find the distance around the outside edge of each pool below.



Which of the pools above has the biggest perimeter?

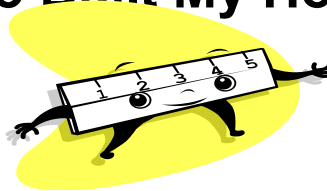
Do you think the pool with the biggest perimeter holds the most water? Explain.



Measurement Authority: _____



Who Built My House?



Read the poem “Who Built My House?” Answer the questions that follow.

Who Built My House?

I wonder who built my house
One side is three inches high
The other side three and a half
I cannot figure out why

One side of my door is one and a half
And the other one and three-fourths
From the ground to the top of each side
Measured in inches of course

I need a ladder to measure my roof
I'm worried that it will be wrong
One side measures _____ inches
The other is _____ inches long



1. Draw a picture of the house described in the poem using a ruler to make your measurements match those in the poem.

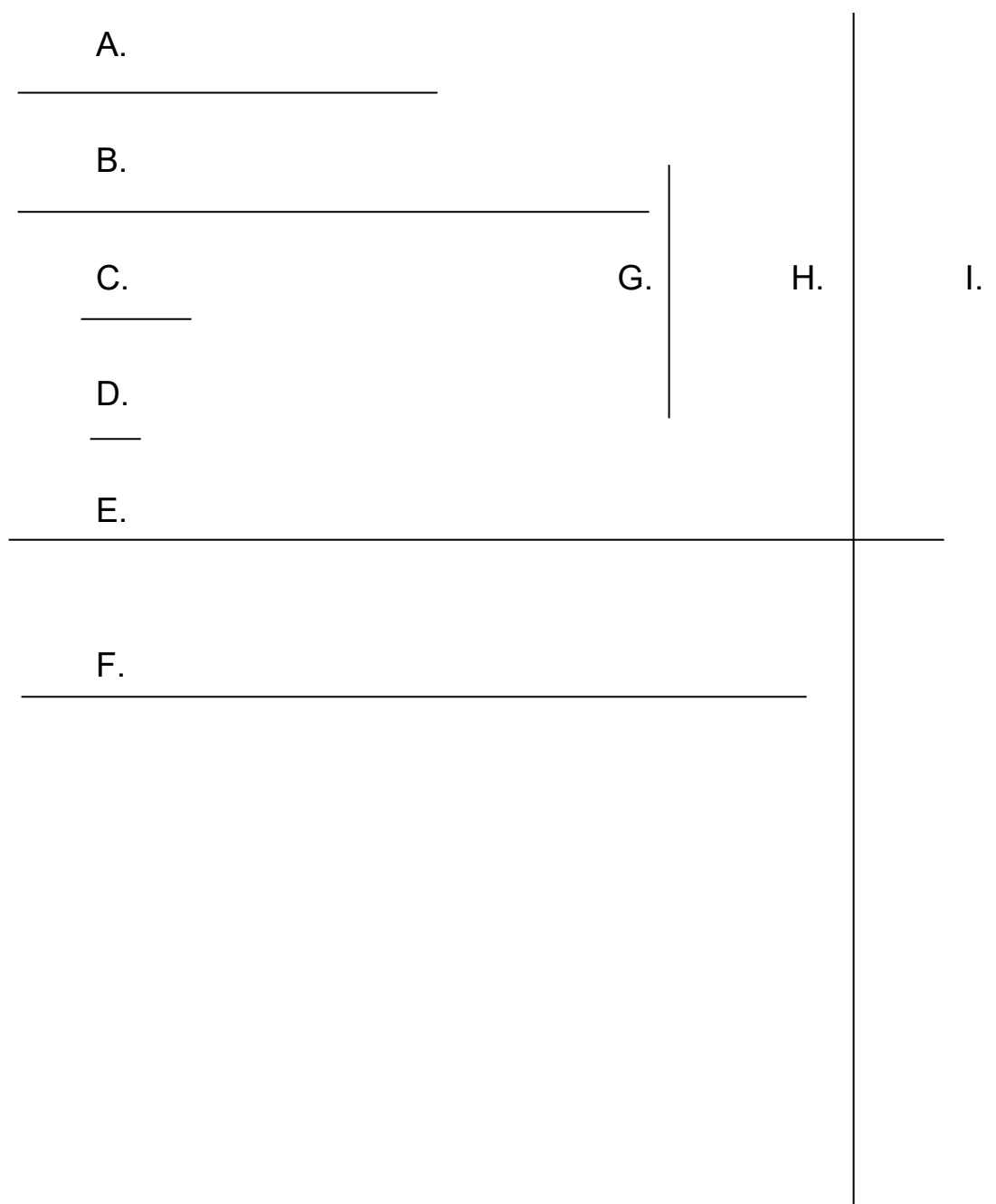
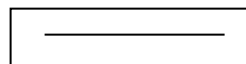
2. The length of each side of the roof is not given in the poem.
Measure the sides of your roof in inches and write your answers in the blanks in the poem.

3. Explain why it is important for house builders to measure accurately.

Ruler Without a Ruler: _____

Ruler Without a Ruler

The line segment in the box is 1 inch long. Use that segment to ESTIMATE the lengths of the other segments. (You may cut the segment out and use it as a ruler to help you.)





Master of the Mystery Ruler: _____

The ?-Inch “Ruler”

Directions: Use the strip of paper provided by your teacher to estimate the perimeter of the 10 objects around the room.

- WRITE the name of the object in the table.
- ESTIMATE the perimeter of each object using the strip of paper provided.
- RECORD your estimates in the table.
- DESCRIBE the process your group used to estimate each perimeter.

MY RULER SIZE IS _____ INCHES.

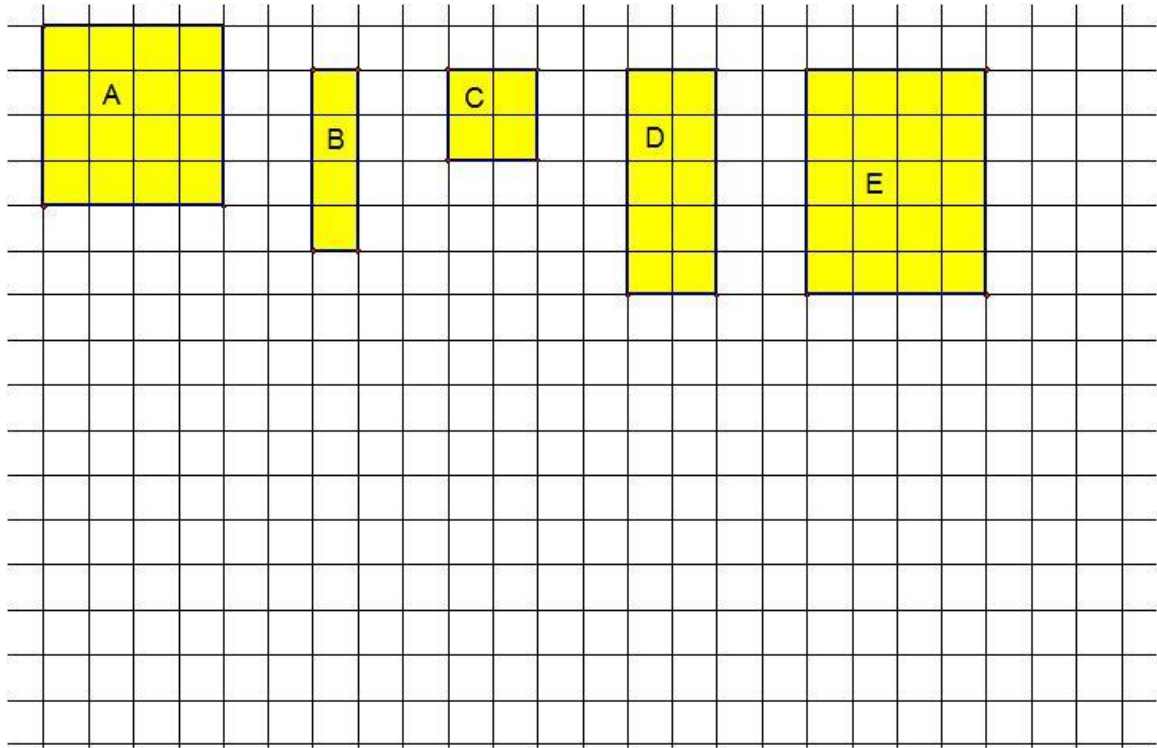
Object	Perimeter (in.)	Describe the process used to estimate the perimeter of this object.
1.		
2.		
3.		
4.		



Shape Wizard: _____



That's Another Dimension!



1. Label the dimensions of each figure in units.
2. Find the perimeter of each figure.

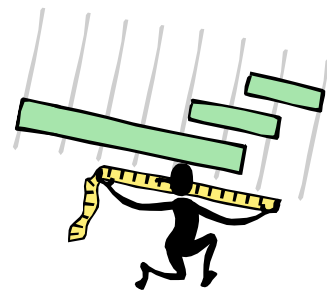
Perimeter A = _____

Perimeter B = _____

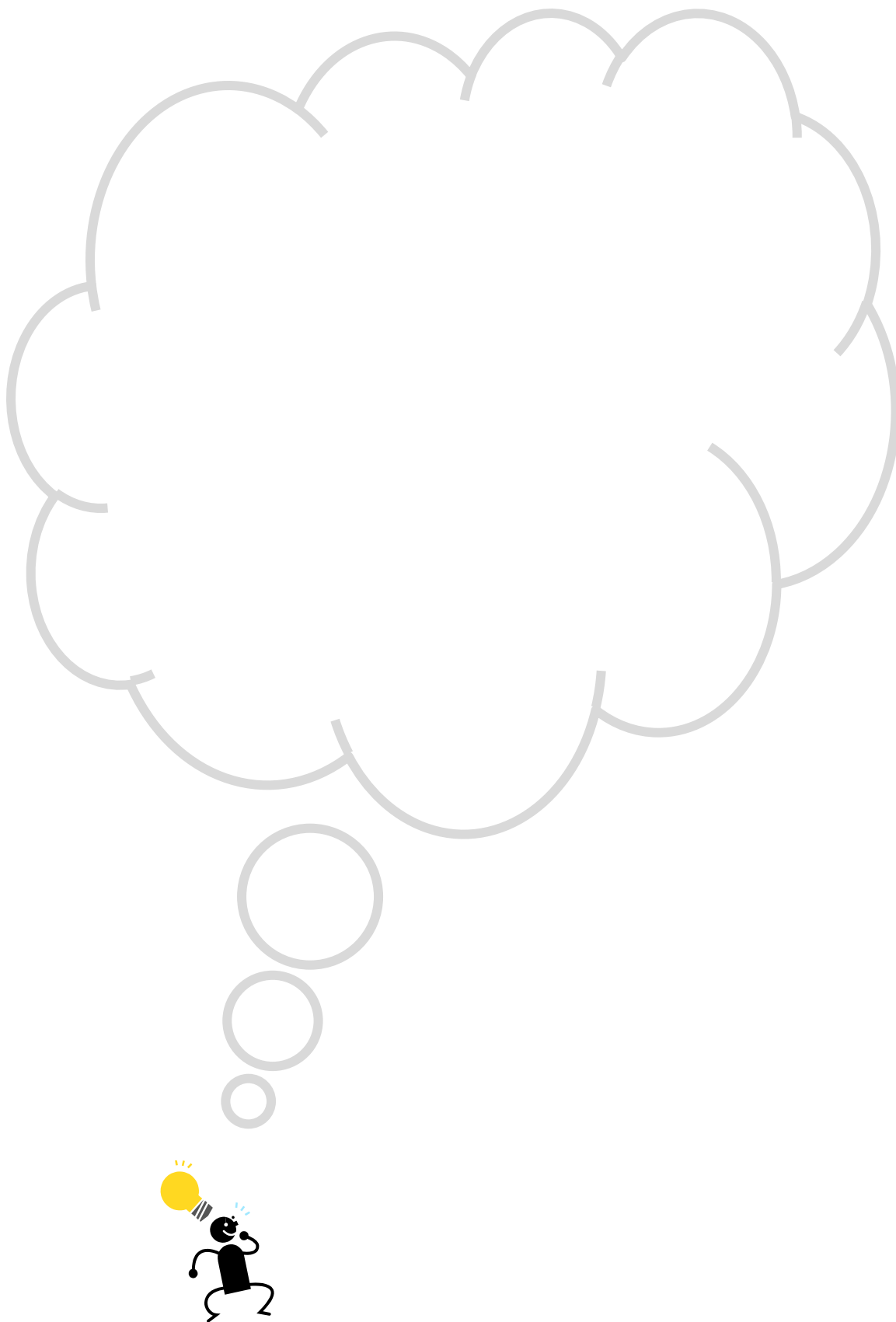
Perimeter C = _____

Perimeter D = _____

Perimeter E = _____

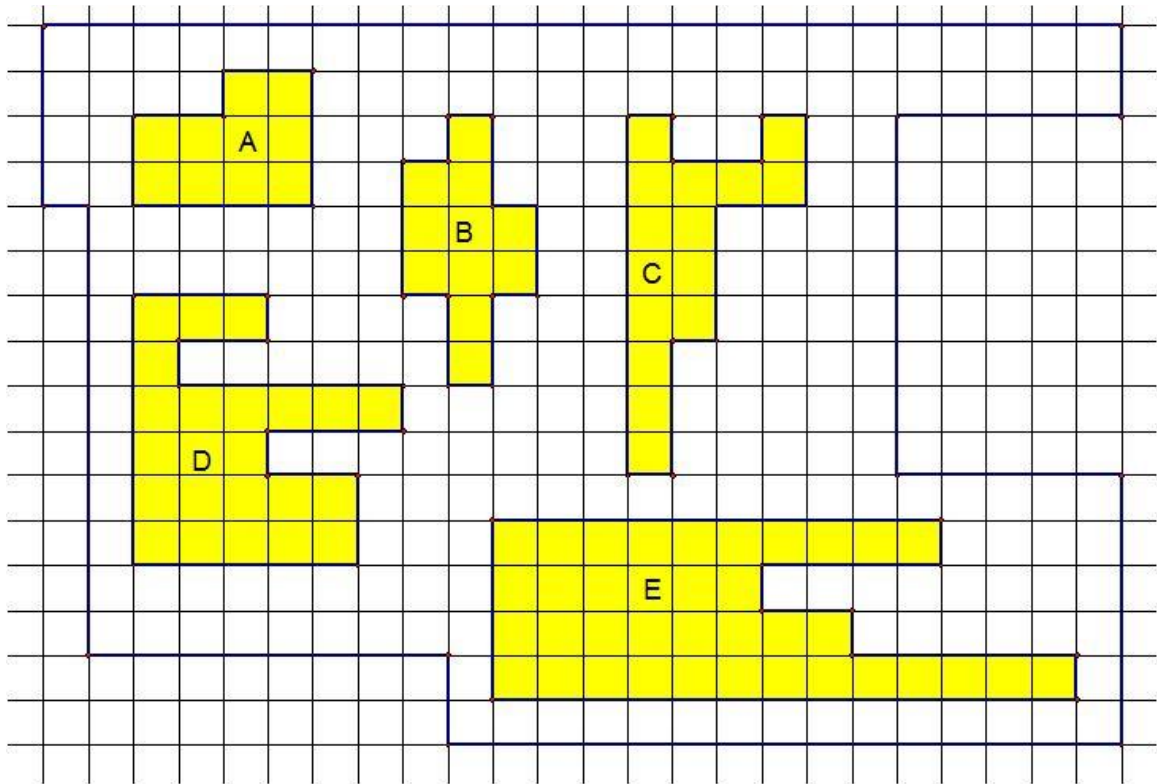


3. Draw another figure that has the SAME perimeter as Rectangle A but DIFFERENT dimensions. Label it A also.
4. Repeat step 3 for Rectangles B, C, D, and E. (If you need more graph paper, ask your teacher.)



Perimeter Seeker: _____

Perimeter Seeker



Directions: Find the perimeter of Figures A, B, C, D, and E. Then find the perimeter of the shape going around all of those figures.

Perimeter A = _____

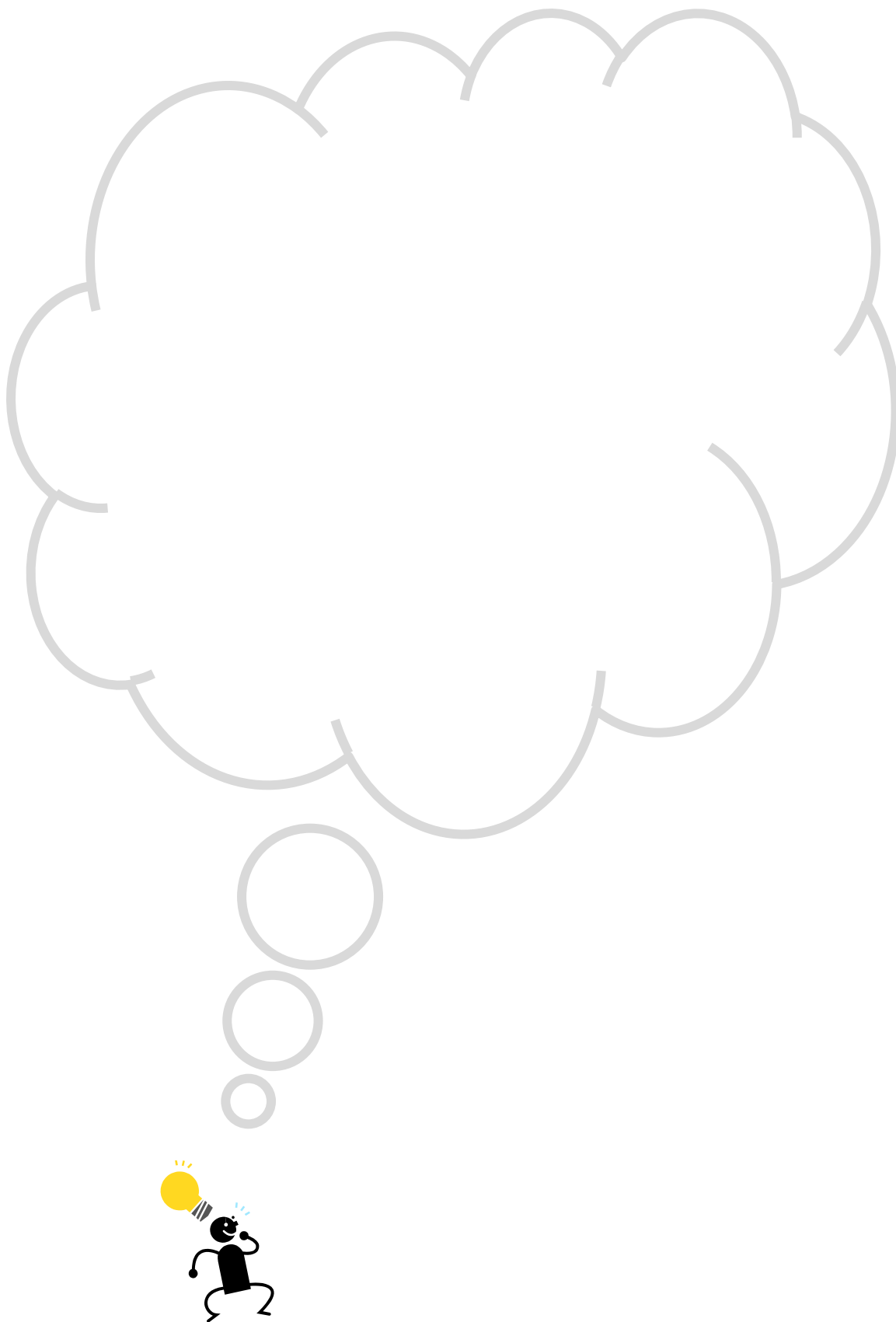
Perimeter B = _____

Perimeter C = _____

Perimeter D = _____

Perimeter E = _____

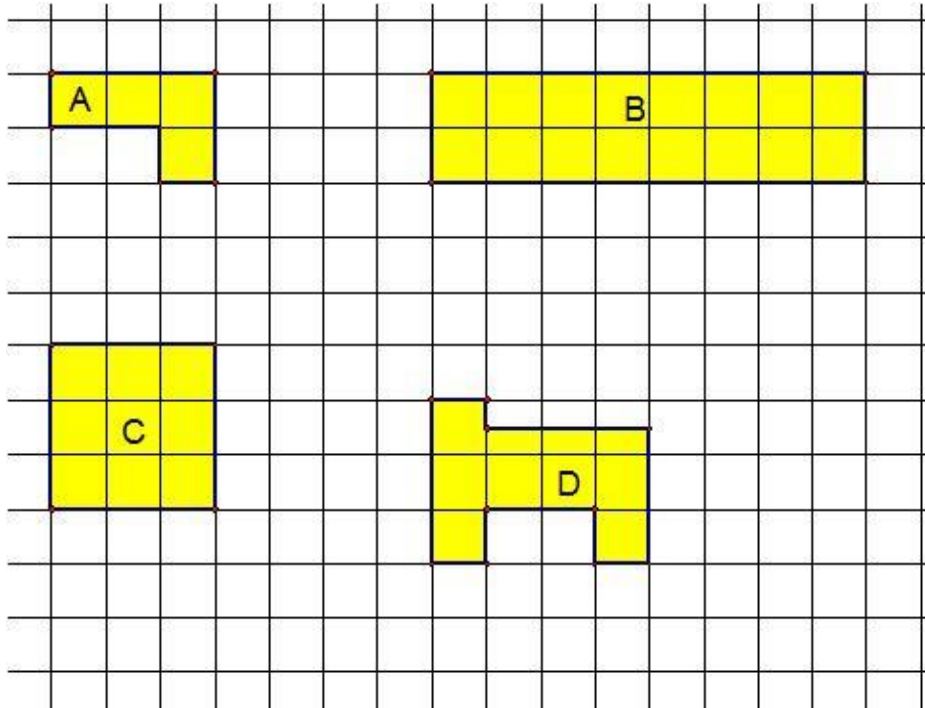
Outside Perimeter = _____



Name: _____ Date: _____

Check Up #3

1. Find the perimeter of each figure in the diagram.



Perimeter A = _____

Perimeter B = _____

Perimeter C = _____

Perimeter D = _____

2. Draw a line segment each length.

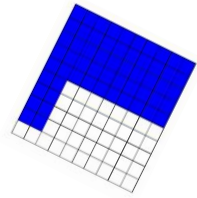
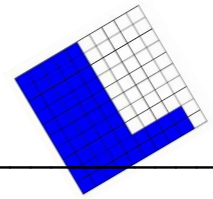
3 inches:

2 $\frac{1}{2}$ inches:

4 $\frac{1}{4}$ inches:



Investigators: _____



A Fair Way to Shade

1. You have been given a grid covered with squares. Without counting one-by-one, figure out how many squares are on the grid.

How many did you get? _____

Explain how your group determined the number of squares.

2. Each group member will shade a piece of the grid. You must use the following rules for shading.

- Each group member must choose his or her own color.
- The group must determine how many squares each person will shade so that everyone has the same number.
- Each part that you shade must be connected. You **MUST** be able to shade your whole section without lifting your pencil.

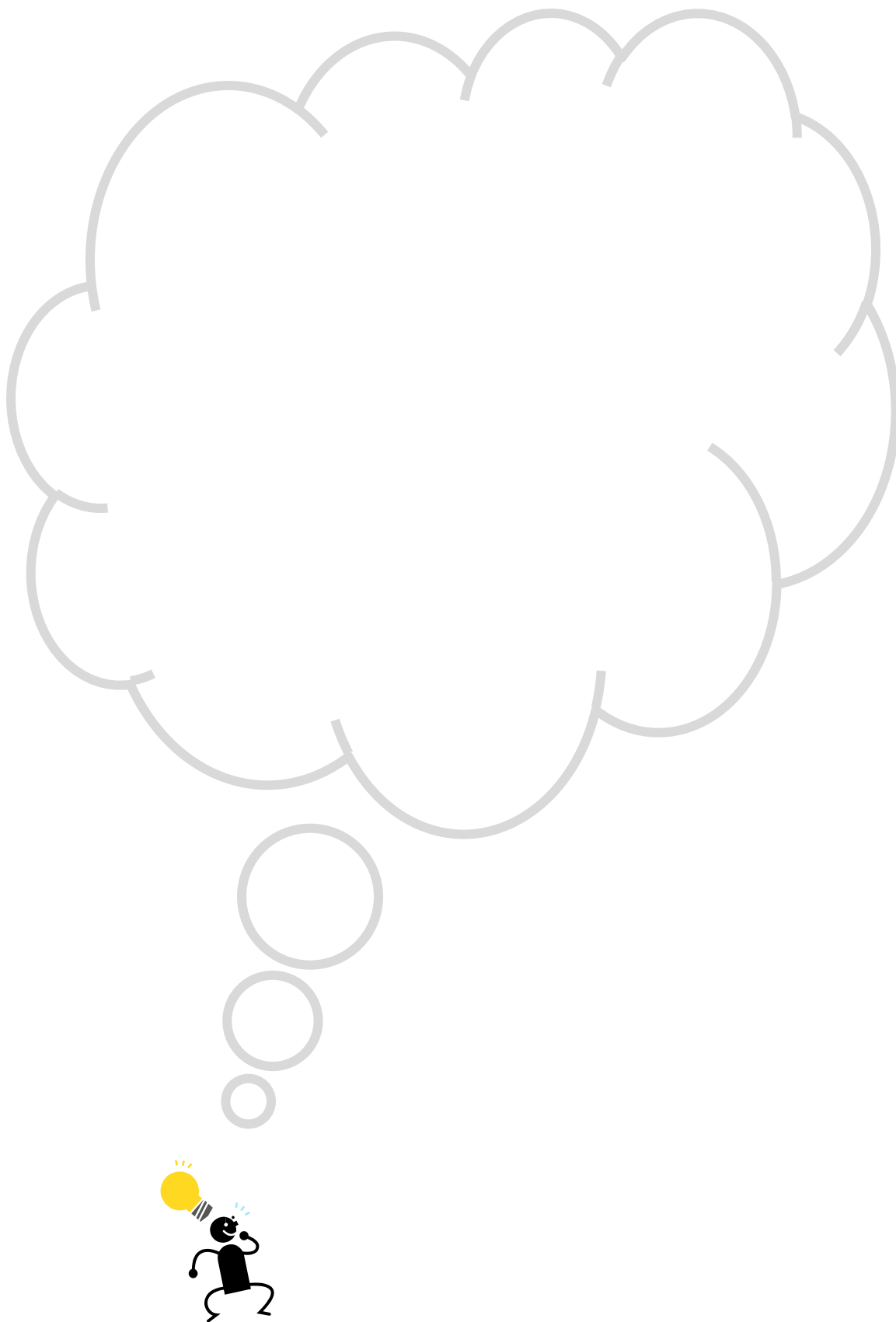
3. How many squares did each student in your group shade?

Student 1: _____

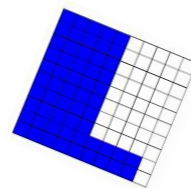
Student 2: _____

Student 3: _____

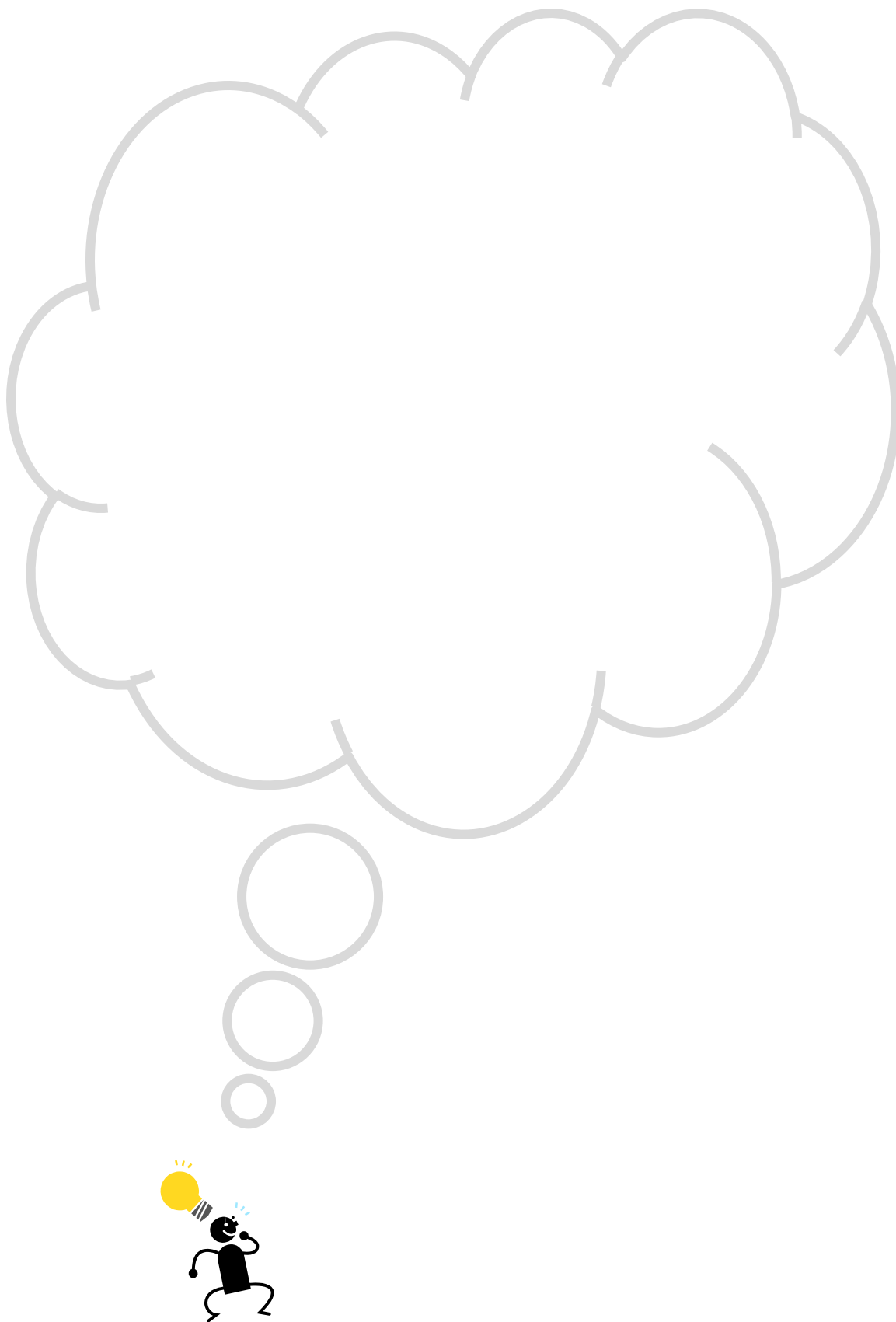
Student 4: _____



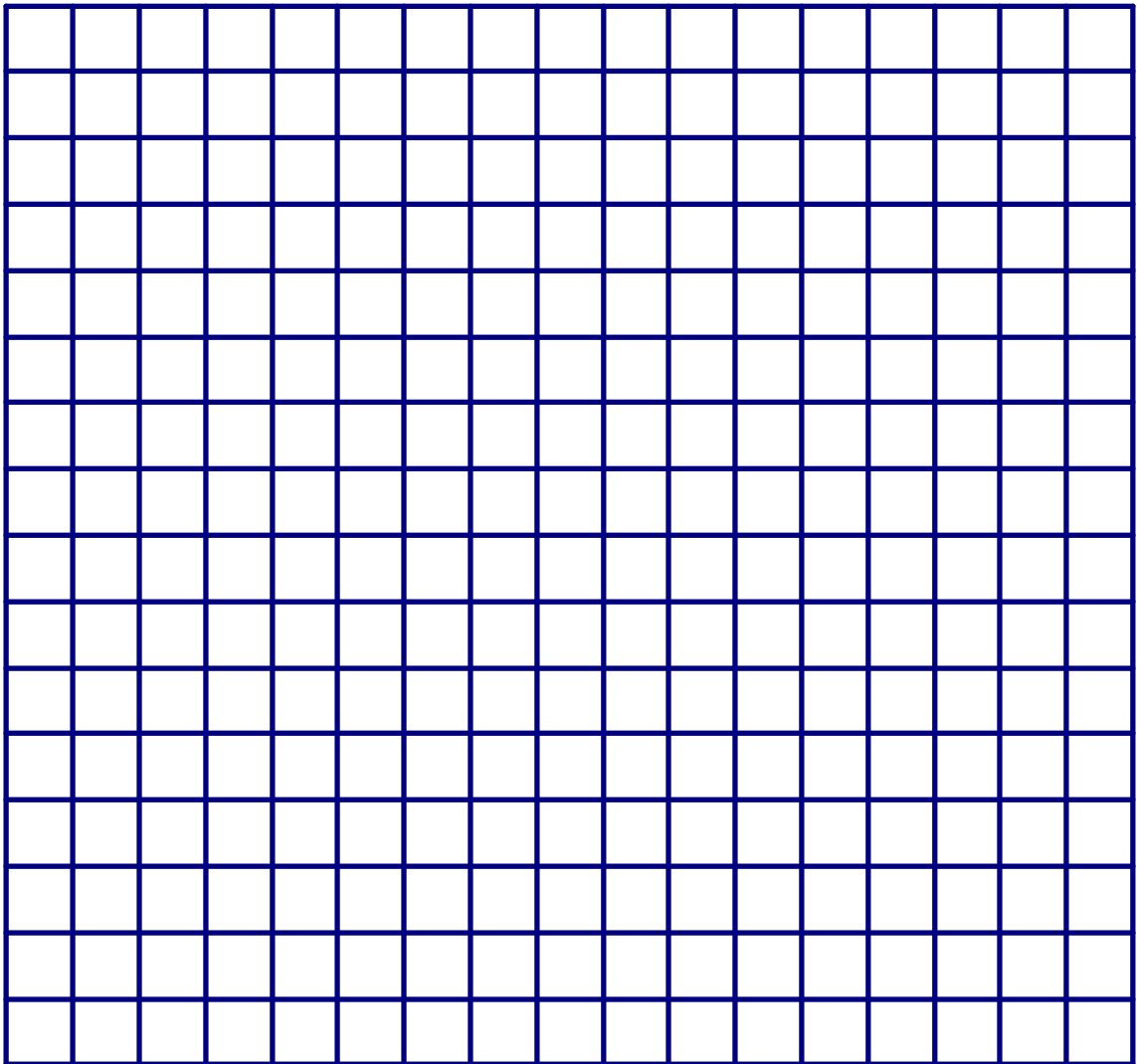
4. Calculate the sum of your answers to #3. Show your work below.

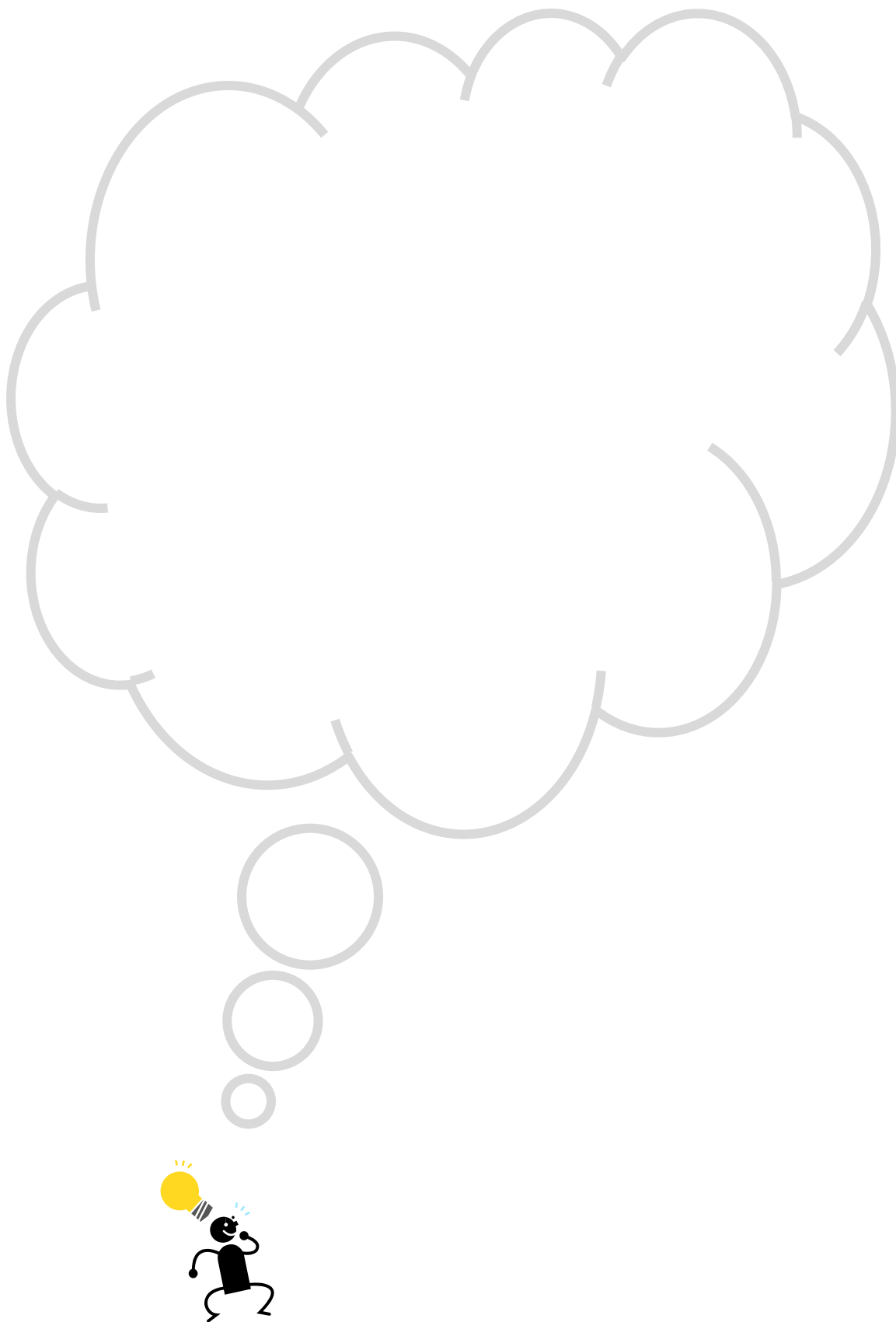


5. What do you notice about the sum you calculated in #4?



SQUARE GRID: HOW MANY SQUARES?

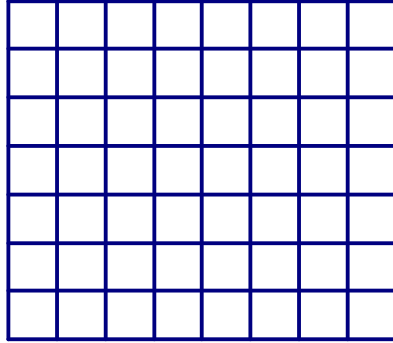




Non-counter: _____

Non-counter

1.
 - a. Without counting one-by-one, tell how many squares are in this grid.



- b. Explain how you found the number of squares.
2. If you were playing a game with a friend and each of you had to color the same number of squares to fill the grid, how many would each of you color?
3. If 4 people were playing the game, how many squares would each person color?
4. If 7 people were playing the game, how many squares would each person color?
5. Explain what would happen if 10 people tried to color the same number of squares each.



Area Estimator: _____

Area Estimator

To complete this activity you may need: A ruler and calculator.

1 inch = 800 kilometers

Use this information and a ruler to estimate the perimeter of the 48 contiguous United States in kilometers. You may draw on the map to show your work.

1 square inch = 640,000 square kilometers

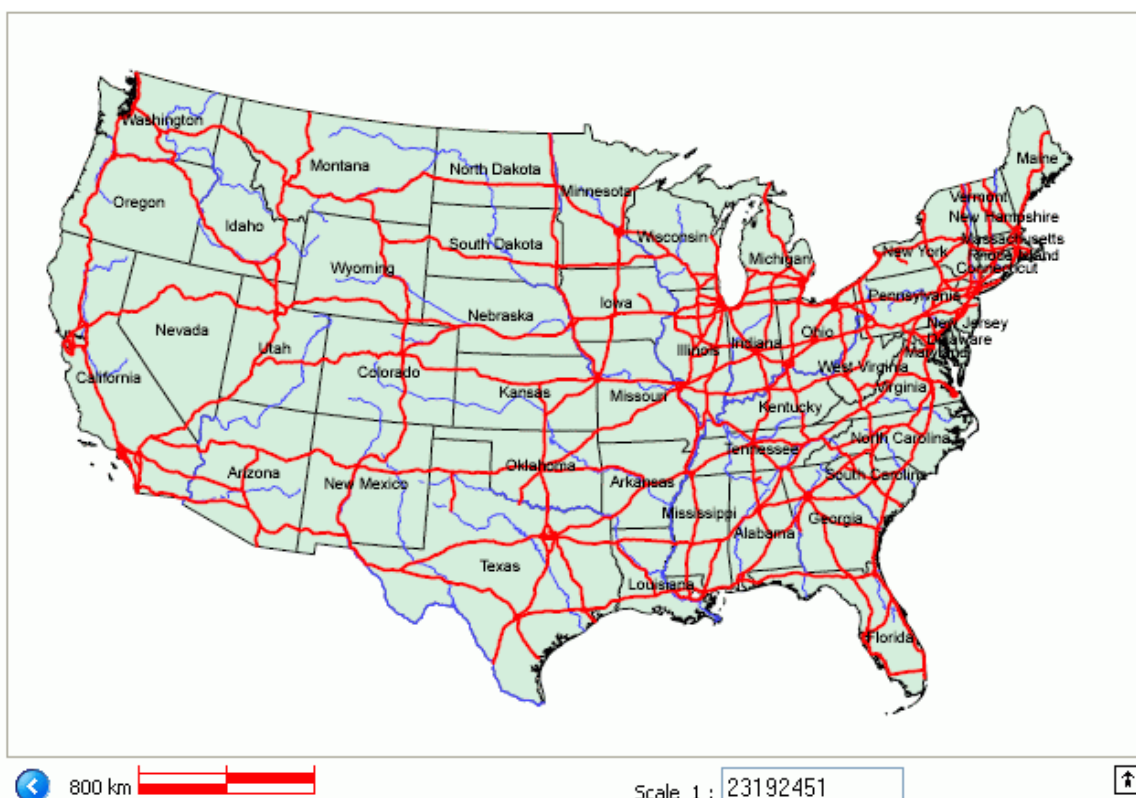
Use this information to estimate the area of the 48 contiguous United States in square kilometers.

1 inch



(A square inch is a square that is one inch on each side.)

(Contiguous means the States are adjacent, or next to, each other.)



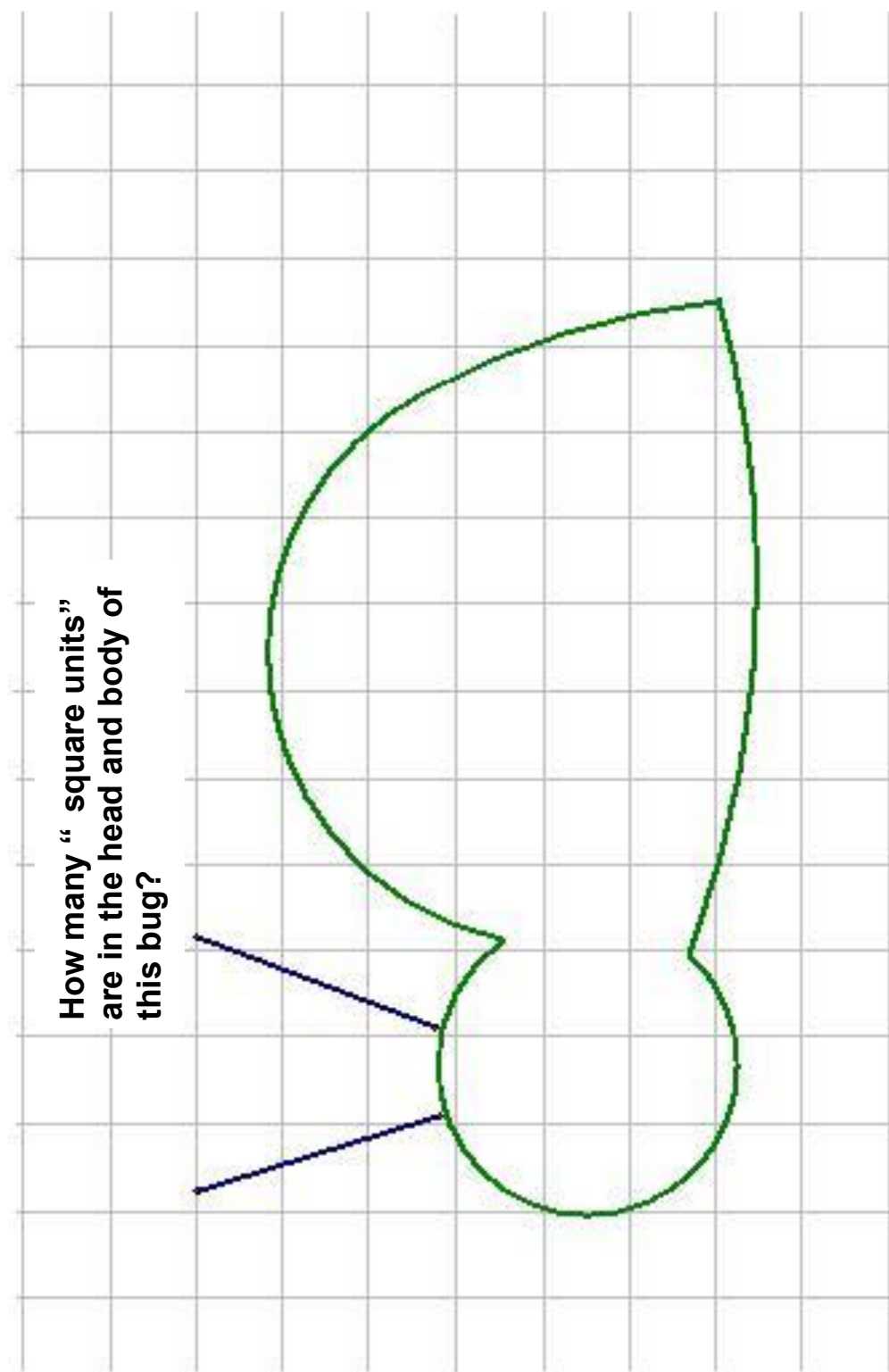
<http://gis-web.marylandheights.com/frontdesk/commands/help/helpMap.asp>



Area Analyst: _____

How Many Square Units?

Task #1





Task #2

Estimate the area of each figure. Write your answers in “square units.”

Figure A: _____

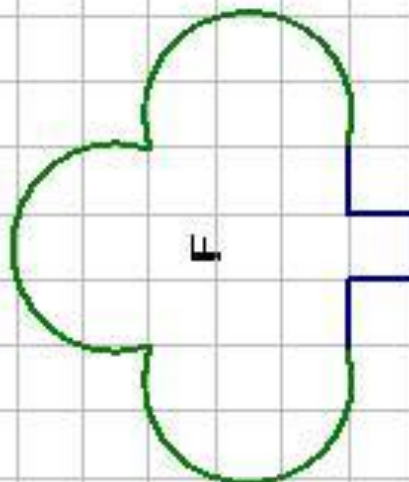
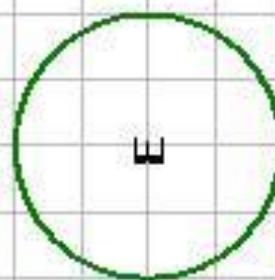
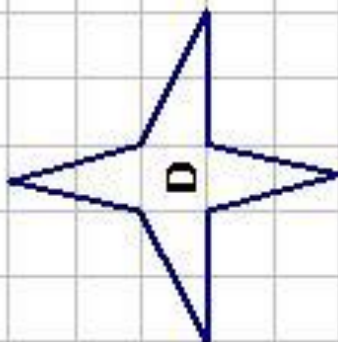
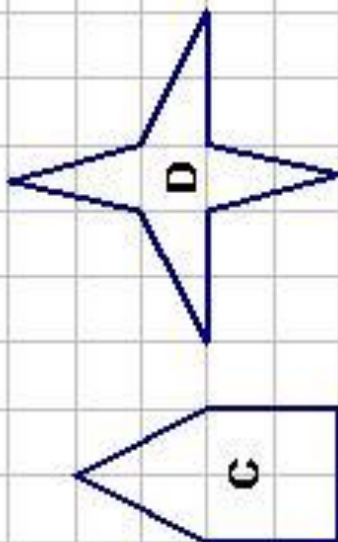
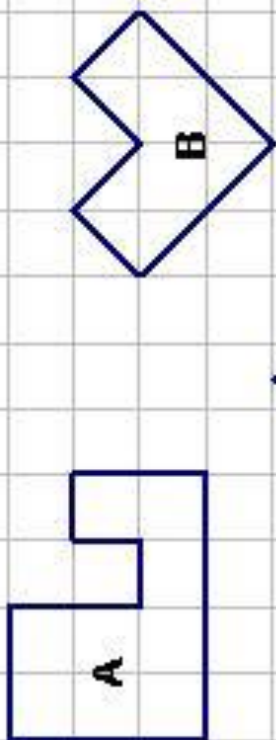
Figure B: _____

Figure C: _____

Figure D: _____

Figure E: _____

Figure F: _____





Committee Members: _____

Area Agreement From the Committees

Directions: In your committee, determine which estimate was highest and which was lowest. Record these estimates. Then, come up with a fair estimate for your group and record this on the “Committee’s Decision” line.

1. Figure A

High Estimate: _____

Low Estimate: _____



Committee’s Decision: _____

2. Figure B

High Estimate: _____

Low Estimate: _____



Committee’s Decision: _____

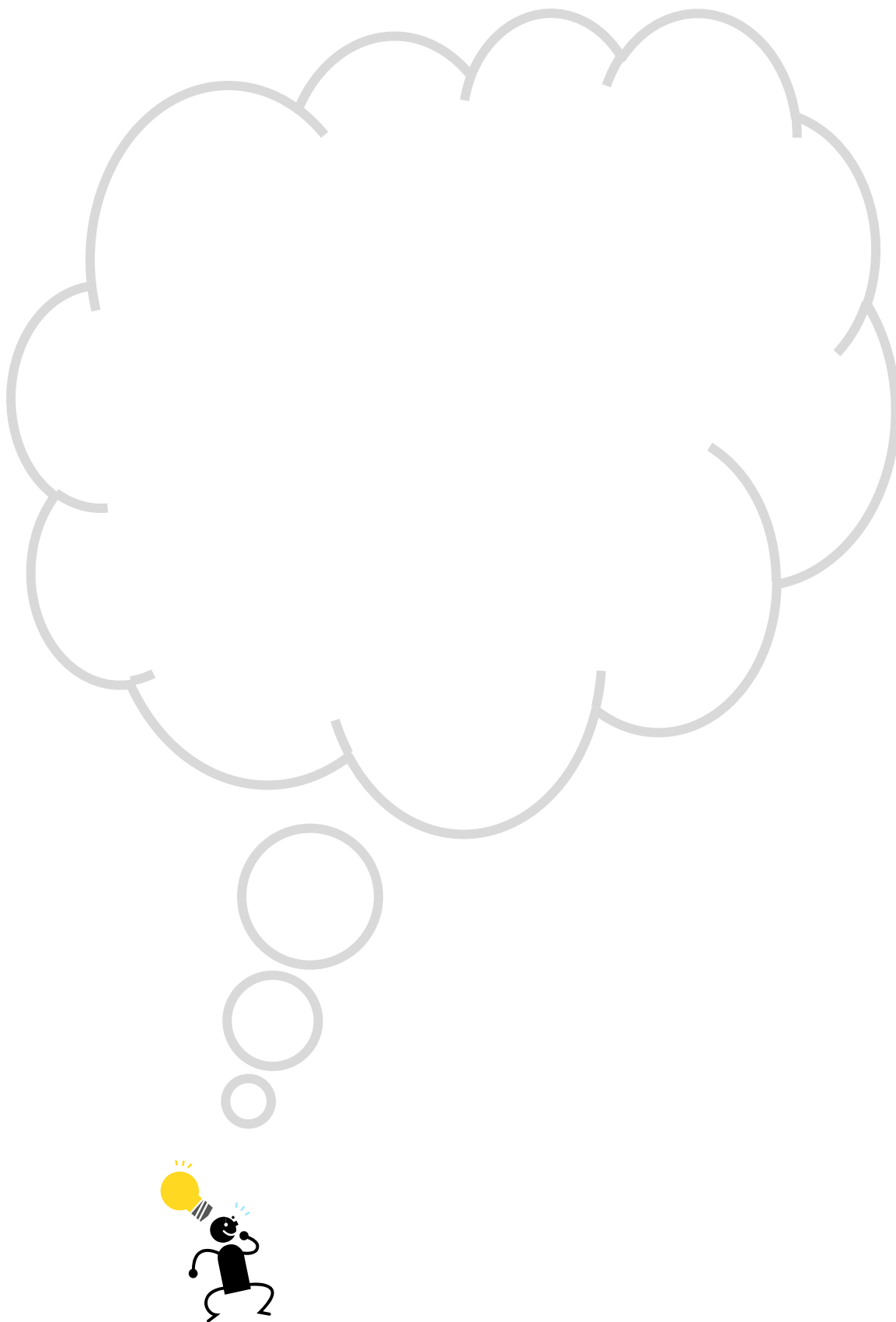
3. Figure C

High Estimate: _____

Low Estimate: _____



Committee’s Decision: _____



4. Figure D

High Estimate: _____

Low Estimate: _____



Committee's Decision: _____

5. Figure E

High Estimate: _____

Low Estimate: _____



Committee's Decision: _____

6. Figure F

High Estimate: _____

Low Estimate: _____



Committee's Decision: _____

7. Which area was easiest to agree on? Why?



8. Which area was the hardest for your committee to agree on? Why?





A Geometry Scavenger Hunt

Search your school, home, or other locations to find examples of each of the following:

- A right angle
- An obtuse angle
- An acute angle
- A pentagon
- A hexagon
- An octagon
- Something that is between 3 1/2 and 4 1/2 inches long
- Two congruent rectangles
- A pair of congruent figures that are *not* quadrilaterals
- Something with a perimeter that you might measure in inches
- Something with a perimeter that you might measure in feet
- An object with a circumference
- *Student's choice: Choose your own object related to geometry*
- *Student's choice: Choose your own object related to geometry*



Scavenger Hunter: _____

Scavenger Hunt Findings

OBJECT	Where we found it...	How I know what it is...
Right angle		
Obtuse angle		
Acute angle		
Pentagon		
Hexagon		
Octagon		
Object between 3 1/2 and 4 1/2 inches long		
Pair of congruent rectangles		
Pair of congruent figures (<i>not</i> quadrilaterals)		
Something with perimeter in inches		
Something with perimeter in feet		
Object with a circumference		
Your choice: _____		
Your choice: _____		

Designers: _____

A Shapely Living Room

You are creating a new room in your house. In this project, you will tile the floor, put trim around the edge, and furnish the room. Follow the directions to create your room.

DAY 1 Materials

- Blueprint of floor (1 per group)
- Small tile sheet (Hypatia level) or Large tile sheet (Pythagoras level)
- 2 different color crayons, markers, or colored pencils
- Inch ruler
- Ribbon or yarn (teacher holds this and cuts to order)
- Glue stick
- Scissors

DAY 2 Materials

- Construction paper
- Scissors
- Glue/Tape
- Inch ruler
- Other materials students bring in to build mini furniture
- Toothpicks or straws

I. Tiling the floor

1. With your group, decide how you will tile the floor using the tiles provided.
2. Use scissors and glue to lay the tile on the floor.
3. Estimate the total number of tiles used.

- How many tiles are on your floor? _____
- Explain how your group worked together to agree on the number of tiles.

4. Color the tiles using 2 different colors.



II. Trimming the room

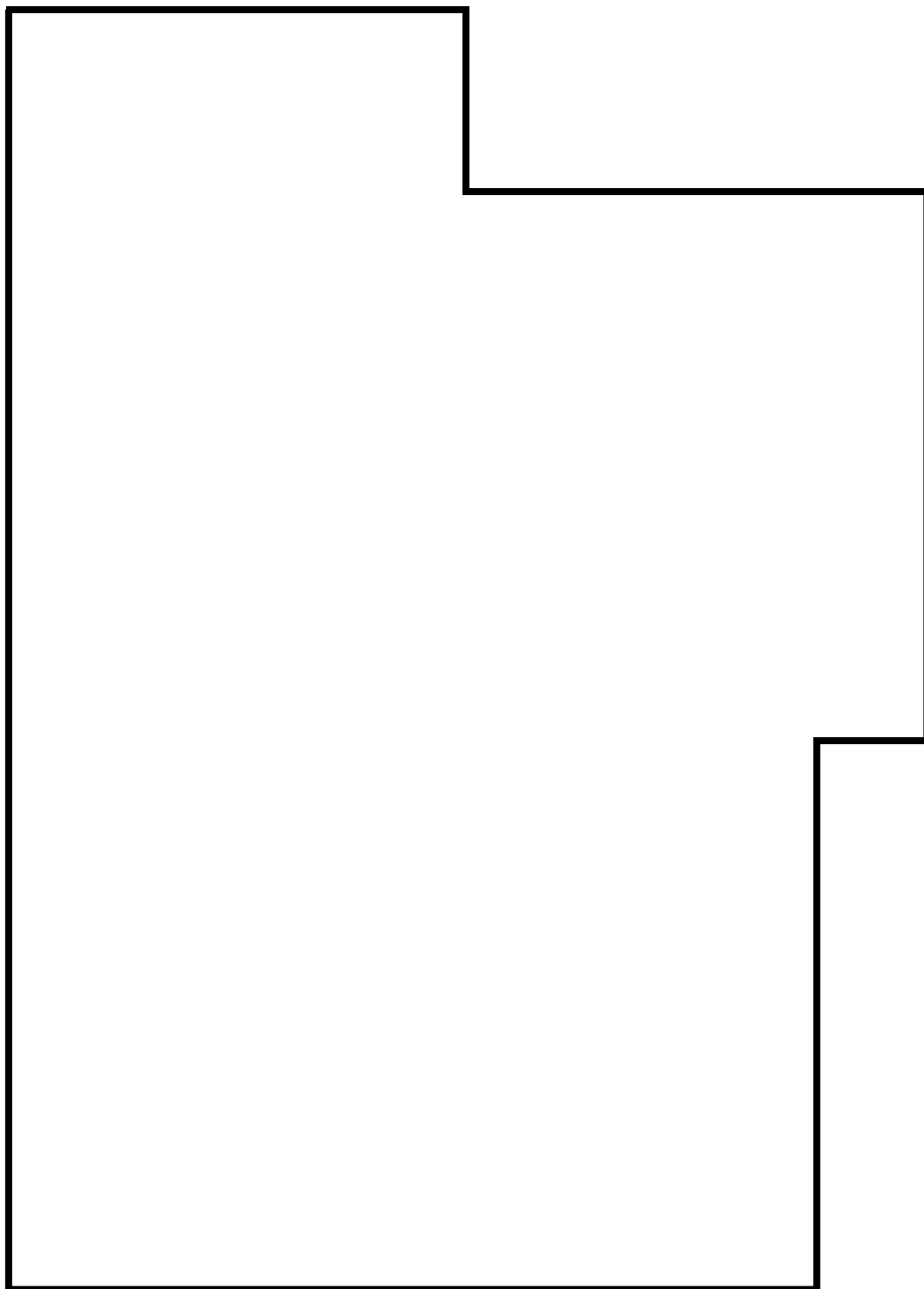
1. As a group, you must find a way to estimate the perimeter of the room in inches.
2. Once you have an estimate, ask your teacher for border. Tell the teacher how many inches you need to go around your room.
 - Explain the method your group used to find the perimeter.

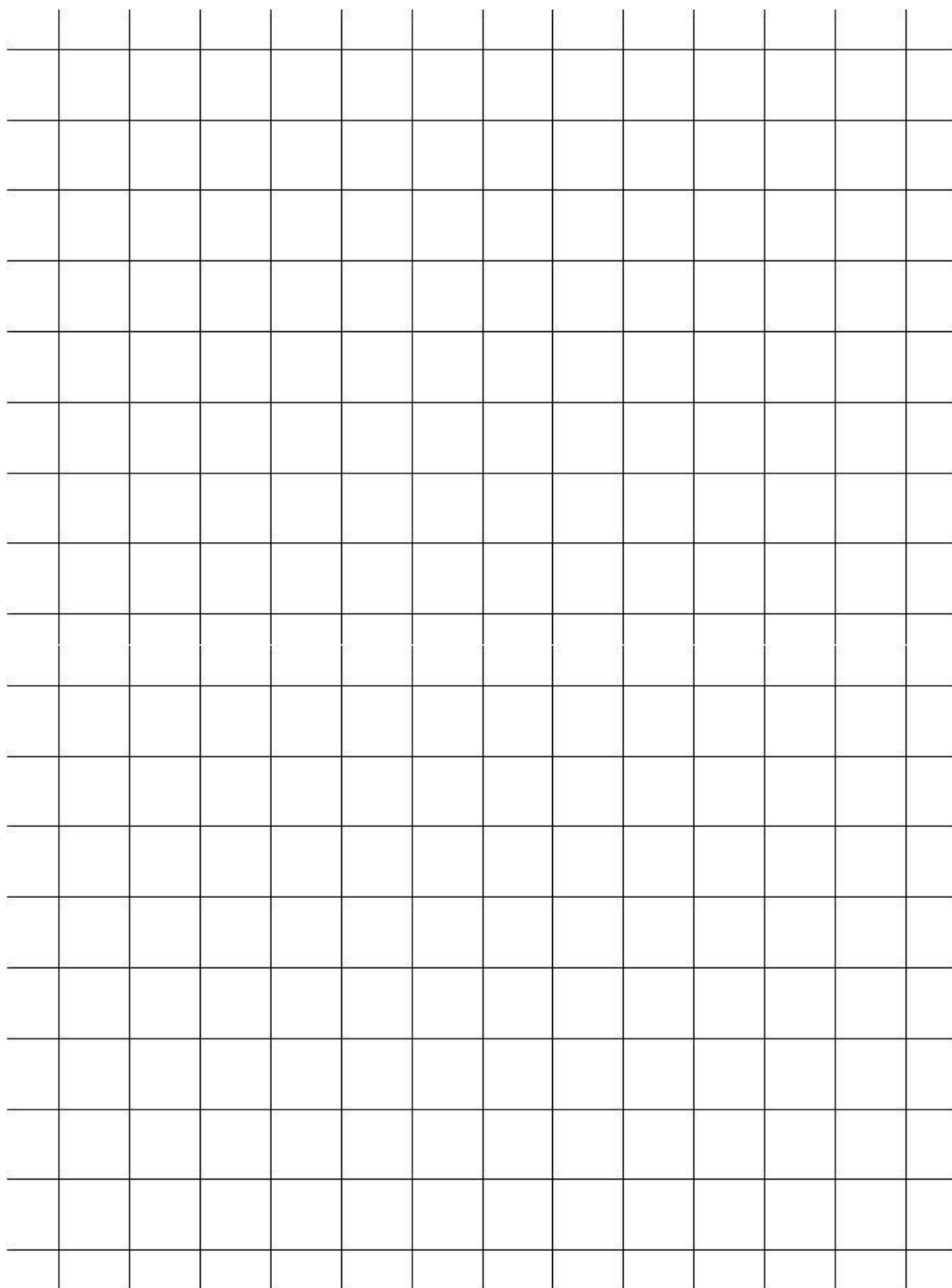
3. Glue the border around the perimeter of the room.

III. Mini furniture design (Day 2)

1. Create mini furniture to go in your room. Use these directions:
 - Each person in the group must make at least 1 piece of furniture alone. (Once you have finished your own, you can work with somebody else to create more.)
 - The furniture in the room must contain at least 5 different shapes. Decide as a group what shapes will be used.
 - Look at the pictures for ideas but use the ideas of your group also.

The floor of your room: All furniture must be small enough to fit in this room.





Designers: _____

Some “Shapely” Furniture Ideas



- Complete the table below about the shapes you used in designing your furniture.

Name of Shape	Which piece of furniture has that shape?	How do you know it is that shape?	How tall (in inches) is the piece of furniture containing that shape?
1.			
2.			
3.			
4.			
5.			

Geometry & Measurement for All Shapes & Sizes Mathematical Language

Acute Angle: An angle that is greater than 0° but less than 90° .

Adjacent: To share a side.

Angle: A figure that is formed by two sides of a polygon with a common endpoint.

Area: Number of square units covering a surface.

Asymmetric: Not symmetric.

Circle: Set of points a fixed distance from a center.

Circumference: Distance around a circle.

Clockwise: A rotation in the same direction that the hands of a clock move.

Congruent Figures: Figures that have the same size and shape.

Congruent Sides: Sides of equal length.

Counter clockwise: A rotation in the opposite direction that the hands of a clock move.

Decagon: A polygon with ten sides.

Denominator: The part of a fraction that is below the line and divides the numerator.

Diagonals of a Polygon: Line segments in a polygon connecting non-consecutive vertices.

Diameter: Line segment passing through the center of a circle and has end points on the circle.

Dimensions: The length and width of a rectangular figure.

Endpoints: The points on a line segment that show where it begins and ends.

Equivalent Fractions: Fractions that are equal, like $\frac{1}{2}$ and $\frac{2}{4}$.

Estimate: An answer that is as mathematically close to the real answer as possible.

Flip (reflect): To turn over.

Fraction: Part of a group, number, or whole.

Heptagon: A polygon with seven sides.

Hexagon: A polygon with six sides.

Horizontal Line Segment: A line segment drawn in the left-right direction.

Inch: A unit of standard measurement.

Line Segment: Part of a line with two endpoints.

Nonagon: A polygon with nine sides.

Numerator: The part of a fraction that is above the line and is divided by the denominator.

Obtuse Angle: An angle that is greater than 90° but less than 180° .

Octagon: A polygon with eight sides.

Pentagon: A polygon with five sides.

Perimeter: The distance around a figure.

Point: An exact location in space, usually represented by a dot.

Polygon: A closed figure formed by three or more line segments.

Quadrilateral: A polygon with four sides.

Radius: Line segment that starts from the center of a circle to any point on the circle.

Ray: Part of a line with one endpoint that goes on forever in one direction. (The sun's rays begin at the sun and go on in one direction.)

Rectangle: A quadrilateral with four right angles.

Regular Polygon: A polygon with all sides and angles congruent.

Rhombus: A quadrilateral with four congruent sides.

Right Angle: An angle that is 90° .

Sides: The line segments that make up a polygon.

Slide (translate): To move an item in any direction without rotating it.

Square: A quadrilateral with four congruent sides and four right angles.

Square units: Units used to measure area (two-dimensional).

Symmetry: An object is symmetrical when one half is a mirror image of the other half.

Transform: To change the position of something.

Triangle: A polygon with three sides.

Triangle Sum Theorem: The sum of the interior angles of any triangle equals 180° .

Turn (rotate): To rotate around a point.

Unit: A standard of measurement.

Vertex (vertices): The point where the rays of an angle meet. The point(s) where the sides of a polygon meet.

Vertical Line Segment: A line segment drawn in the up-down direction.



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