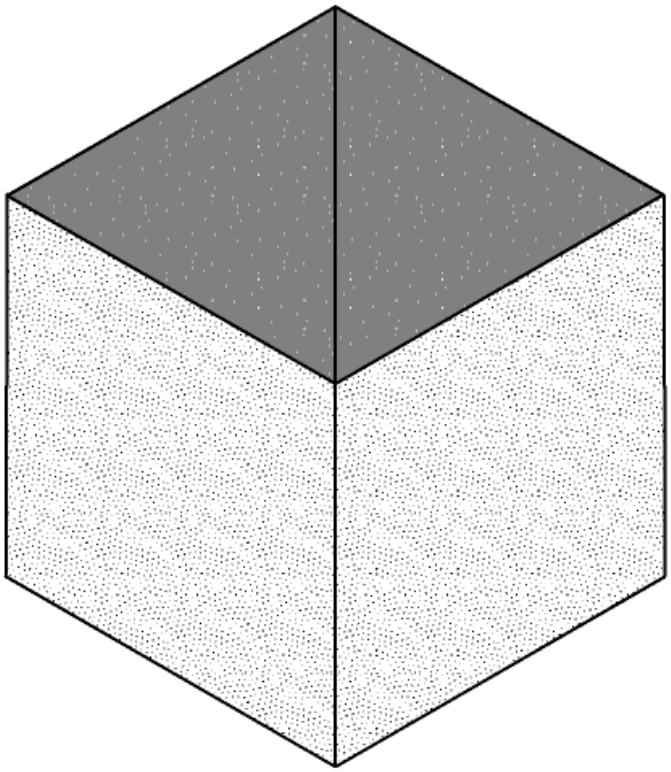
PACK THE BOX

You Need

- One [1] box
- Six [6] identical wooden blocks



Challenge

Pack all the blocks into the box.

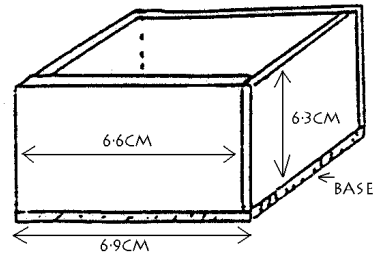
Hint:

Think of the smallest length as one unit and work out the volume of the blocks and the volume of the box.

PACK THE BOX

Teachers: The challenge for students is to pack the box, not make it.
Make the box then put it in the task without this teacher reference page.

- There are 5 wooden pieces. The base is a square (6·9cm x 6·9cm)
- The 4 sides are identical (6·6cm x 6·3cm)
- Tape or glue the sides onto the top of the base.
  The longer 6·6cm side is the one to glue or tape onto the base.
- The final box is a cube with internal dimensions of 6·3cm.
  [It is approximately a 6cm cube. The extra space is for clearance.]



- The six blocks are each 4cm x 4cm x 2cm. If 2cm is taken as the unit then each block is 2 x 2 x 1 and has a volume of 4 cubic units. The challenge is to fit all 6 (total volume of 24) into the 3 x 3 x 3 cubic box (total volume of 27).

PACK THE BOX

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Make the box then put it in the task without this teacher reference page.

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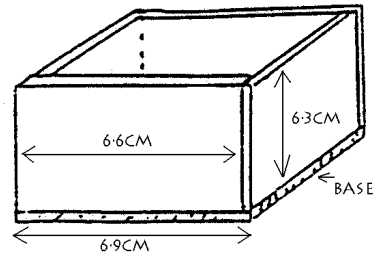

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TIME TOGETHER

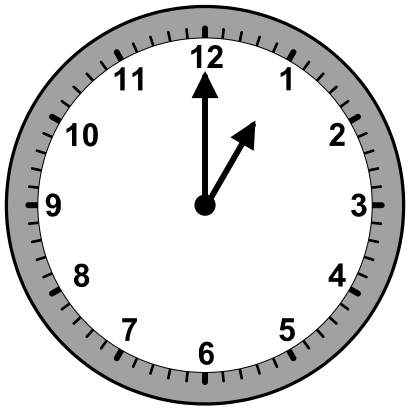
You Need

- Two [2] model clocks

Your Task

1. Soon after one o'clock the big hand is exactly on top of the small hand. What time do you estimate this is?
2. How many times in each twelve [12] hours will the big hand be exactly on top of the small hand?

   Show the times to each other with your clocks.



3. *Estimate* the actual times when the big hand is exactly on top of the small hand.

Challenge

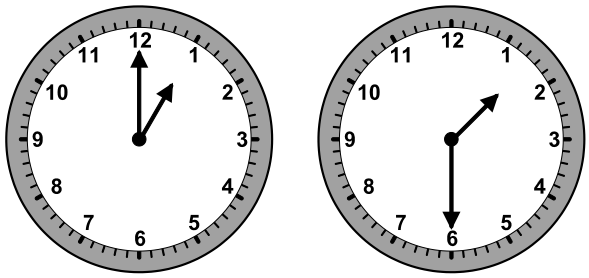
Find a way to *calculate* the times when the big hand is exactly on top of the small hand.

IN BETWEEN TIME

You Need

- Two [2] model clocks

The time difference between the two clocks in this picture is 30 minutes.



Your Task

1. Show a time difference of 30 minutes another way. Record it in your journal.
2. Person A sets their clock to the same as the classroom clock.
   Person B sets their clock so the time difference is 30 minutes.
   There are two answers. Record both.
3. Repeat Question 2 with time differences of your own.

---

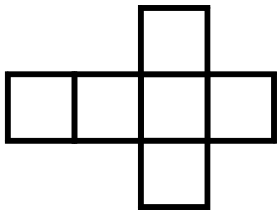
4. Point the hour hand half way between 7 and 8.
   Where must the minute hand be?
5. a) Point the hour hand to one mark past 12 o'clock.
      Where is the minute hand?
   b) Point the hour hand to two marks past 2 o'clock.
      Where is the minute hand?
   c) Point the hour hand to three marks past 5 o'clock.
      Where is the minute hand?
   d) Point the hour hand to four marks past 9 o'clock.
      Where is the minute hand?
6. Point the minute hand to one mark past the 7.
   Explain five places where the hour hand could be pointing.
7. The minute hand is halfway between 4 and 5. What might the time be?

CUBE NETS

You Need

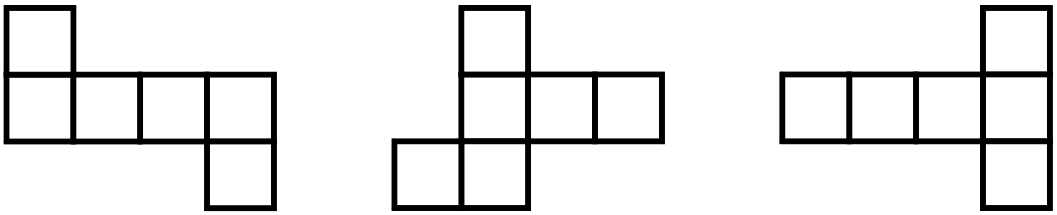
- Twelve [12] click together squares to make two [2] cubes

A net is a flat shape that will fold up to make a three dimensional object. This net folds up to make a cube.



Your Task

1. Join six [6] squares to make a cube.
   Unfold it so that it makes the net in the picture.
2. Remake the cube and try to unfold it to make each of these nets.



Challenge

There are eleven [11] different ways to unfold a cube to make a net.

Find as many as you can and record them in your journal.

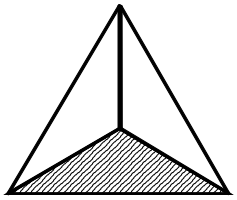
TETRAHEDRON NETS

You Need

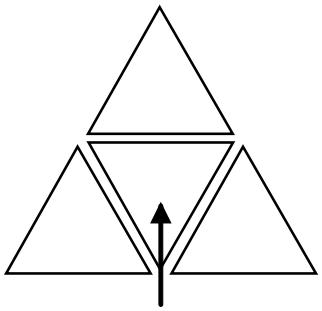
- Eight [8] click together triangles (two [2] each of four [4] colours)

Your Task

1. Make a tetrahedron using four different colours.
   ('Tetra' is Greek for four.)



2. Unfold the tetrahedron into a flat shape like this which is called a net.



Notice the colour of the middle triangle.

3. Fold the net into a tetrahedron again.

   Now unfold it so a different colour is in the middle.

   Repeat until you have made each colour be in the middle.

4. There is one other way to make a net from a tetrahedron.

   Can you find it?

Challenge

Make two tetrahedrons, each with four colours, so that they are *not identical*.

MAKING TRIANGLES

You Need

- At least sixty [60] rods of different lengths (at least fifteen [15] each of red, blue, green, yellow)

In this task you will be making triangles with just three [3] rods each time. You will be searching for three types of triangles:

- *Equilateral* ... all sides are the same length.
- *Isosceles* ... only two [2] sides have the same length
- *Scalene* ... all sides are different lengths.

Your Task

1. Make as many triangles as you can.

   Draw each different triangle you make and show the colour of its sides.
2. How many different triangles are possible?

   How do you know when you have found them all?

Challenge

Just one of the possible triangles has a right angle (or square corner). What colour are its sides?

DIAMONDS & RECTANGLES

You Need

- Three [3] containers and three label cards
- Six [6] diamonds and six rectangles

Your Task

1. Put four [4] diamonds in one container and four rectangles in another. In the third container put two [2] diamonds and two rectangles.
2. Player A secretly labels all of the containers wrongly. For example, put the diamond label on the mixed container.
3. Player B is allowed to choose one object from one container without looking in. With this clue only Player B tries to decide which objects are in which container.

Challenge

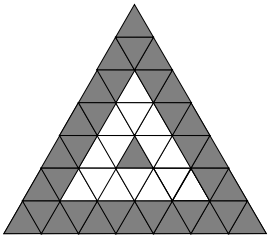
Find a method for choosing and deciding that will always give the correct answer.

DIAMONDS	DIAMONDS	DIAMONDS	DIAMONDS
MIXED	MIXED	MIXED	MIXED
RECTANGLES	RECTANGLES	RECTANGLES	RECTANGLES
DIAMONDS	DIAMONDS	DIAMONDS	DIAMONDS
MIXED	MIXED	MIXED	MIXED
RECTANGLES	RECTANGLES	RECTANGLES	RECTANGLES
DIAMONDS	DIAMONDS	DIAMONDS	DIAMONDS
MIXED	MIXED	MIXED	MIXED
RECTANGLES	RECTANGLES	RECTANGLES	RECTANGLES

TRIANGLES AROUND TRIANGLES

You Need

- Forty-three [43] triangles in Colour A & twenty-one [21] in Col. B
- Recording sheet



You will be making triangles around triangles like this.

Each new triangle is a different colour.

Your Task

1. Start with a single triangle (Size 1).

   Build two more triangles around it. Record.

2. Explain how to find the total number of triangles used.

   Can you check it another way?

3. Explain how to find the number of triangles of each colour.

   Can you check it another way?

4. Explain how to find the number of triangles in the outside border.

   Can you check it another way?

5. Repeat questions 1 - 4 starting with a Size 2 triangle in the middle.

Challenge

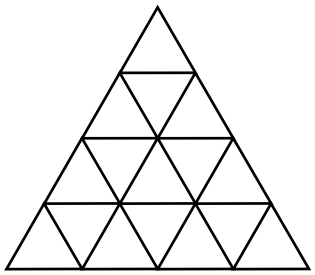
If someone told you any size for the largest triangle, explain in two ways how to find:

- the total number of triangles used.
- the number of triangles of each colour.
- the number of triangles in the outside border.

HOW MANY TRIANGLES?

You Need

- Sixteen [16] click together triangles
- Recording sheet



Make this shape.

It is one [1] Size 4 triangle made from sixteen Size 1 triangles.

Your Task

1. Count the number of Size 2 and Size 3 triangles.

   Hint: Some might be upside down.

2. It only takes one triangle piece to make the Size 1 triangle.
   - Predict the number of triangles to make Size 2. Check by making.
   - Predict the number of triangles to make Size 3. Check by making.
   - Predict the number of triangles to make Size 6. Check by drawing.

3. Make the Size 4 again and fold it up to make a Size 2 tetrahedron (this is like a pyramid). Its total surface area is 16 triangle pieces.
   - Predict the number of triangles to make a Size 1 tetrahedron.
   - Predict the number of triangles to make a Size 3 tetrahedron.
   - Predict the number of triangles to make a Size 4 tetrahedron.

Challenge

If I tell you any Size tetrahedron, can you tell me its total surface area in triangles?

FOLD UP HOUSES

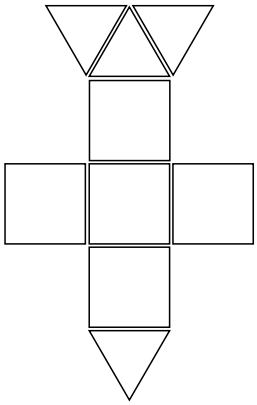
You Need

- Twenty-four [24] mini-squares and twenty-four [24] mini-triangles

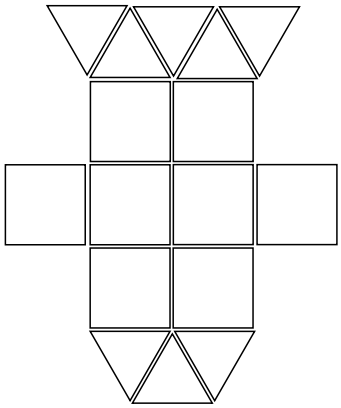
The Story

The Fold Up House Company makes houses from squares and triangles. First they make them on the ground, then they fold them to make the house.

Size 1



Size 2



Your Task

1. The first picture shows a Size 1 house built on the ground.
   Make this then fold it up to make the house.
2. Make and fold the Size 2 house.
3. Design, make and fold a Size 3 house.
4. Investigate the number of squares and triangles used in each size of house.

Challenge

If you tell the Company any size house, they will tell you the number of squares and triangles needed to build it.

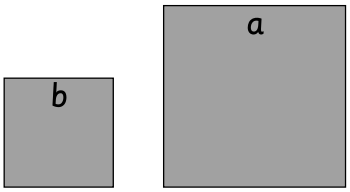
Explain to someone else how they do this.

DIFFERENCE BETWEEN TWO SQUARES

You Need

- Four [4] wooden pieces: two [2] squares with side *b* marked, one [1] rectangle with side *a* marked and one unmarked rectangle

Your Task



1. Use all four pieces to make two squares.
2. Find the pieces that show the *difference between the two squares*.
3. Arrange the difference pieces to make a rectangle and work out its length and width using *a* and *b*.

   When you know the length and width write an expression for its area.
4. a) Draw a three square on top of a six square. Next to it draw the difference rectangle and show its length and width.

   b) Draw $\mathbf{9^2 - 5^2}$. Next to it draw the difference rectangle and show its length and width.

5. If I tell you any two square numbers explain in your journal two ways to work out the difference between them, ie: $\mathbf{a^2 - b^2}$.

Challenge

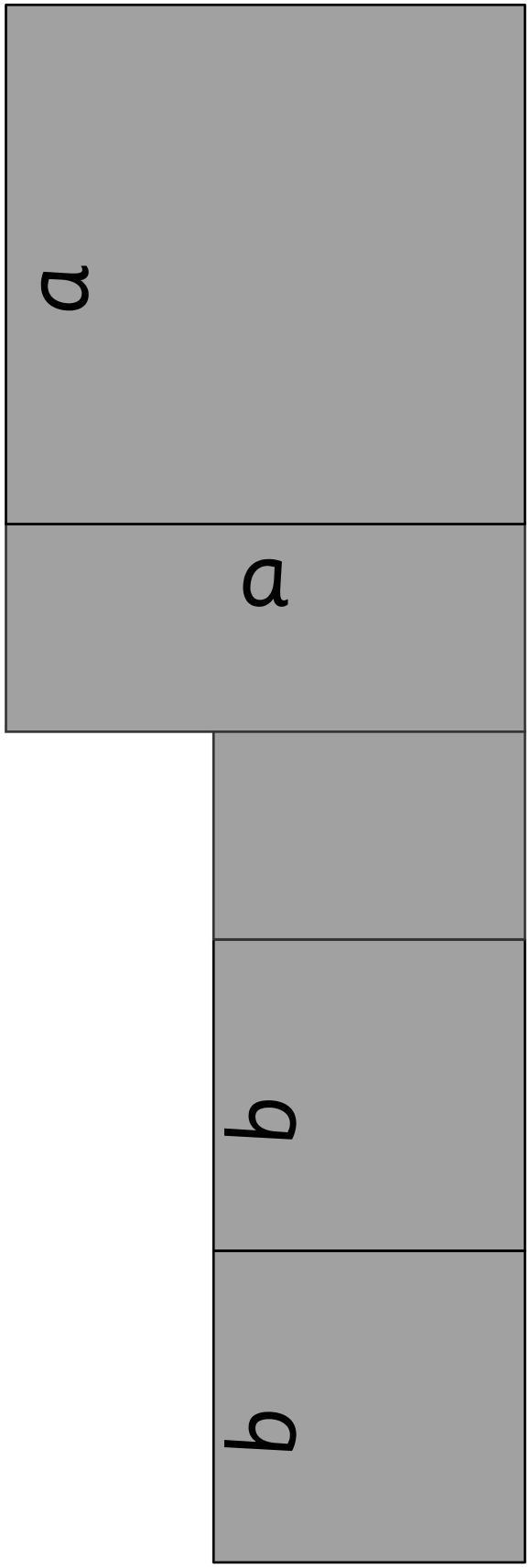
The length and width of the difference rectangle are called the *factors* of $\mathbf{a^2 - b^2}$ because they multiply together to equal $\mathbf{a^2 - b^2}$.

Write down the factors of ... $\mathbf{27^2 - 18^2}$ ... $\mathbf{150^2 - 148^2}$ ... **900 - 169**

This page is a template for the pieces required. You could print on card and laminate before cutting, but a more professional result would entail carpentry or laser cutting. The squares can be any size but the sizes here work well on a table between two students. The sizes are:

Square A = 7.5 x 7.5
Rectangle with side 'a' = 7.5 x 3.0

Square B = 4.5 x 4.5
Extra rectangle = 4.5 x 3.0

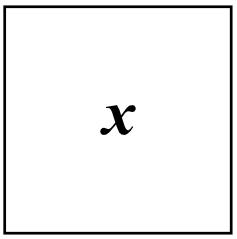


SHAPE ALGEBRA

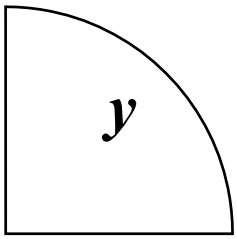
You Need

- One [1] panel of seven [7] shapes within a frame
- One [1] board, marking pen and cloth
- Recording sheet

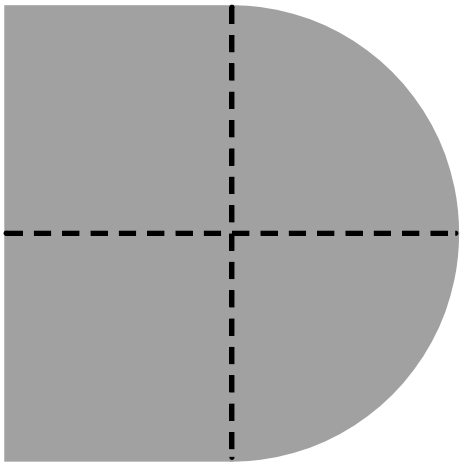
If a square of this size has area x...



and a quadrant of this size has area y...



then this shape



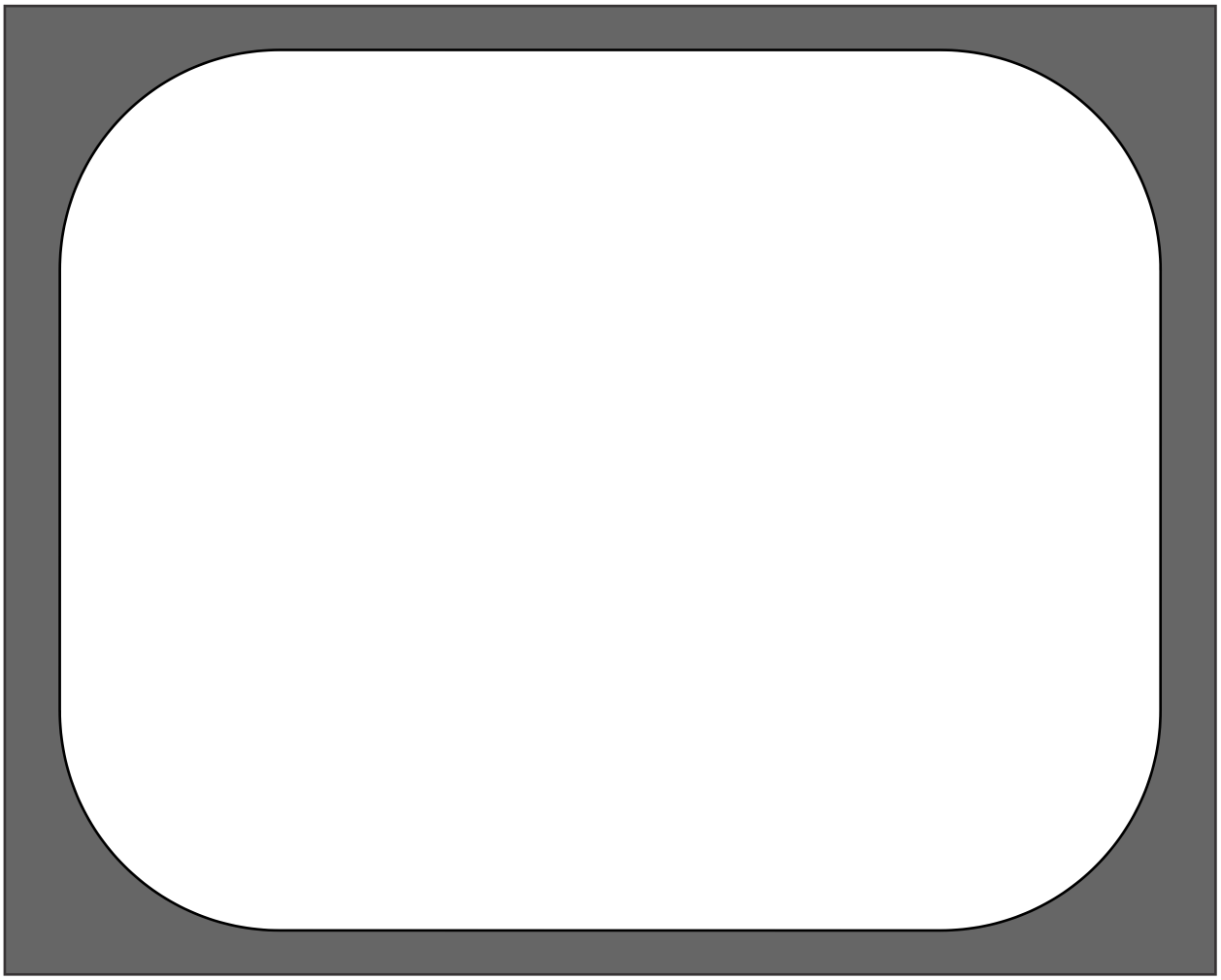
is $2x + 2y$.

Your Task

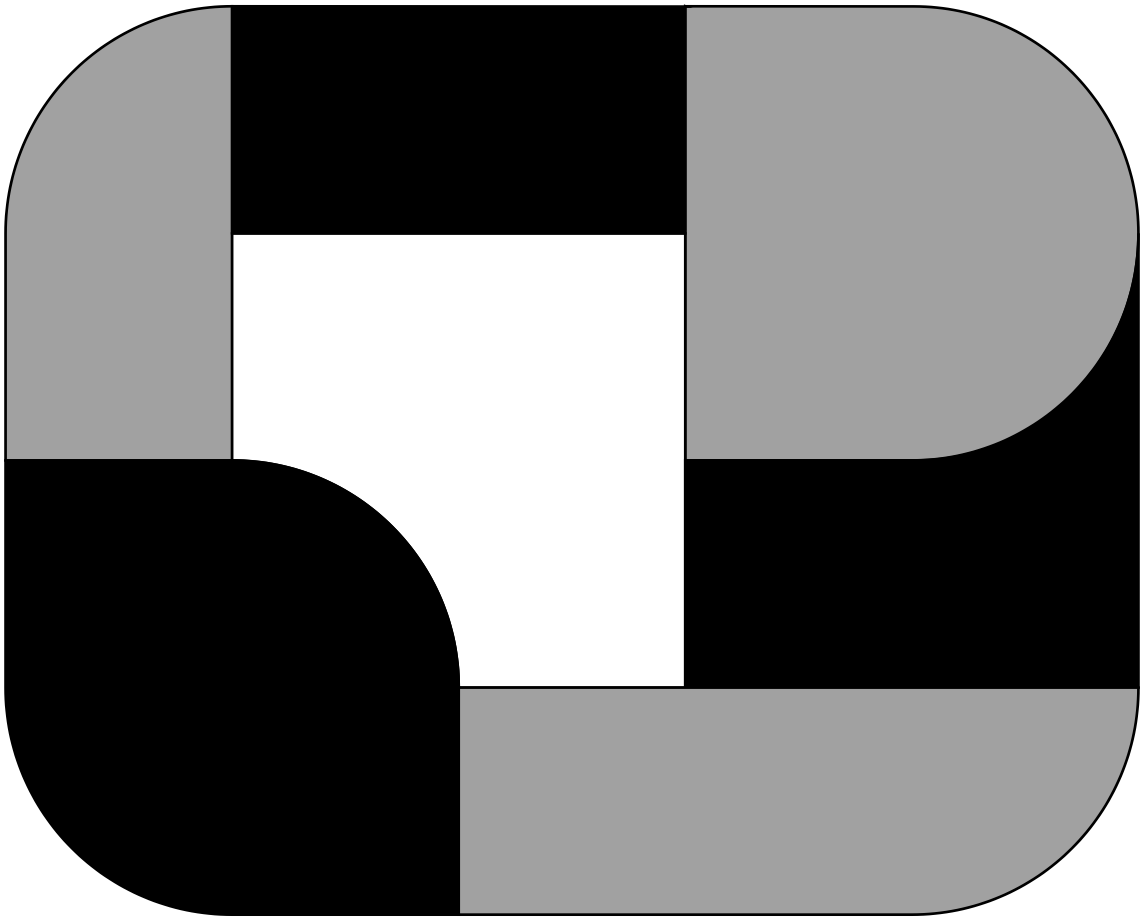
1. Find the other shape which is also $2x + 2y$.
2. Use x and y to find the area of the other shapes. Hint: One is $4x - y$.
3. Now think about the empty frame.

   Think of its *inside* as *one whole piece*.

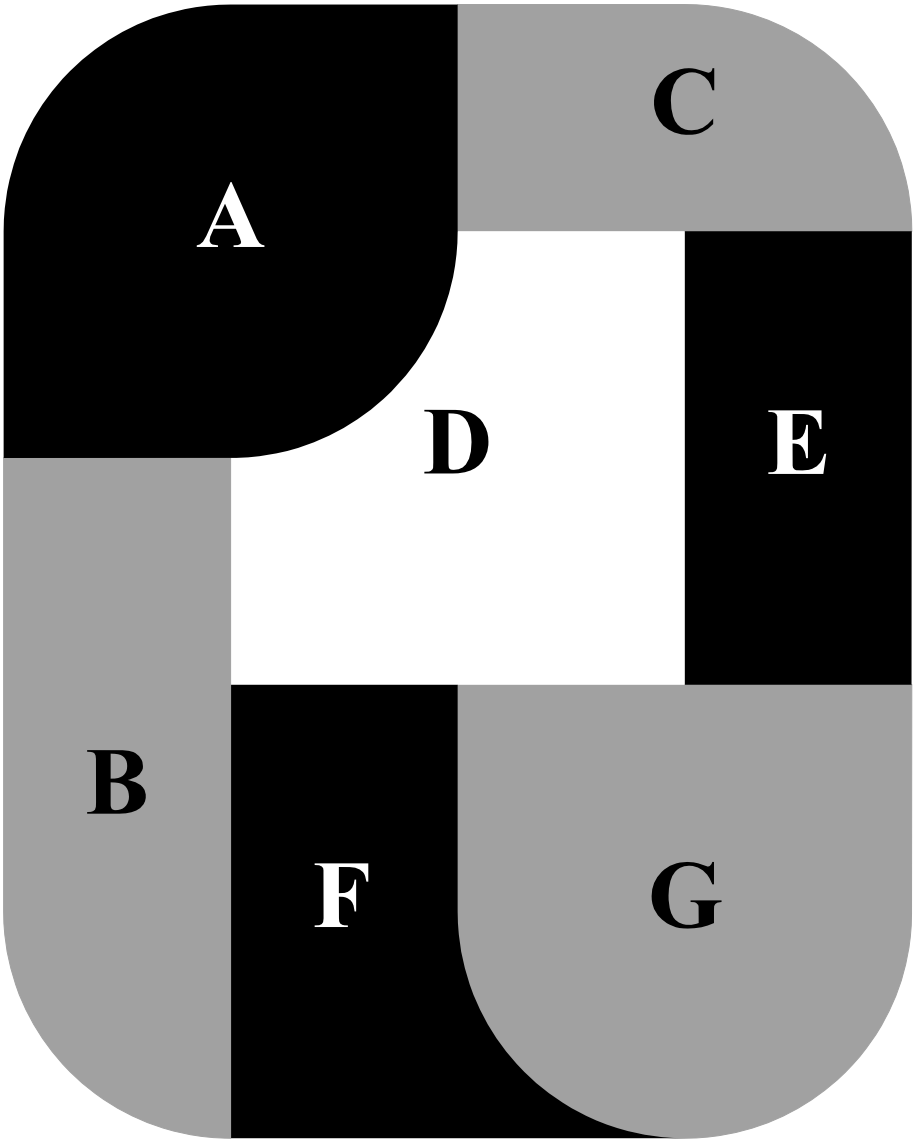
   Work out its total area using x and y.
4. Find the total area of the 7 pieces and compare it to the area of the frame.



SHAPE ALGEBRA: CAREFULLY CUT OUT FRAME AND 7 SEPARATE PIECES



Shape Algebra



Shape A = _____

Shape B = _____

Shape C = _____

Shape D = _____

Shape E = _____

Shape F = _____

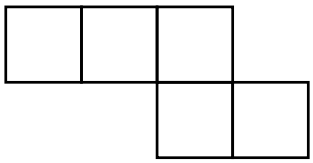
Shape G = $2x + 2y$

PENTOMINOES

You Need

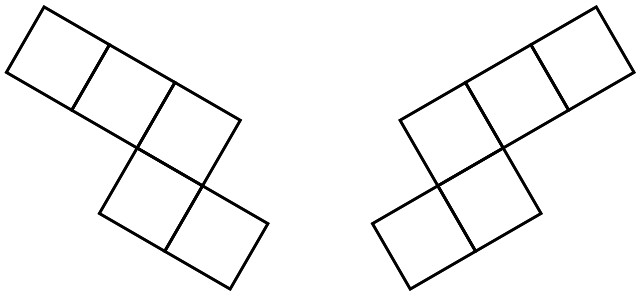
- Twelve [12] pentomino shapes and two [2] boards

- Each pentomino is made from five [5] squares.
- The squares must join along complete sides.
    - This shape is a pentomino.



- A pentomino can be...

turned or flipped



The Story

Mr. & Mrs. Smart bought twelve unusual tiles at the $2 shop. Mrs. Smart asked Mr. Smart to use them to cover the bathroom floor.

Your Task

1. Cover the bathroom floor with two pentominoes.
2. Their son Sam had a better idea.

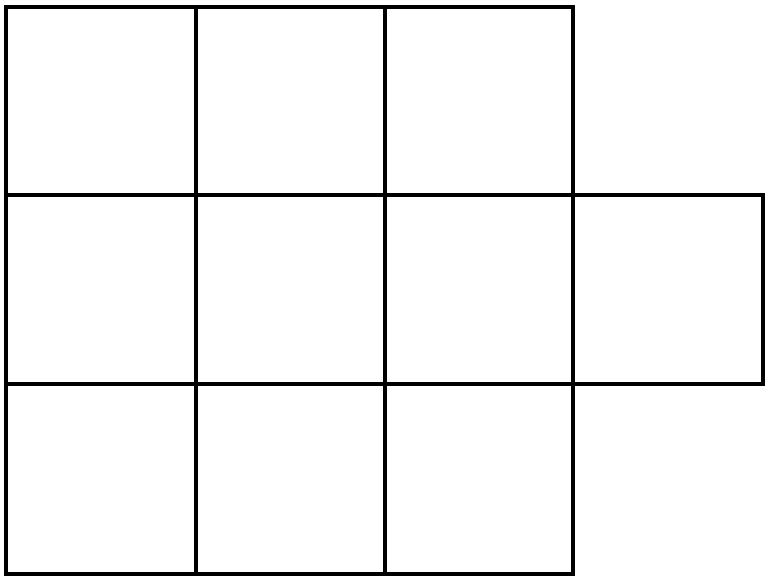
   He said three [3] pentominoes could cover the kitchen floor. How?

Challenge

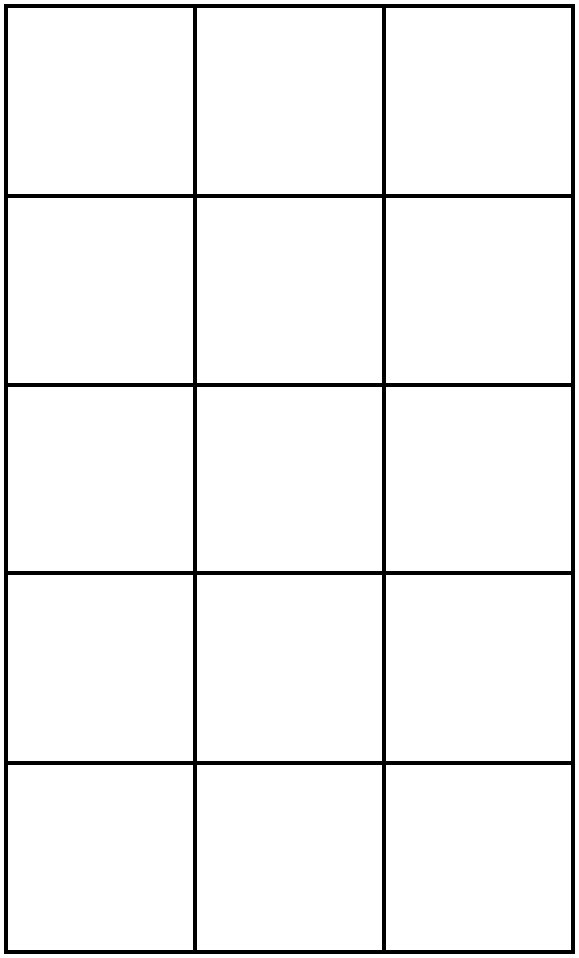
Their daughter Sarah had the best idea.

She could cover the lounge room floor using all twelve pentominoes. How?

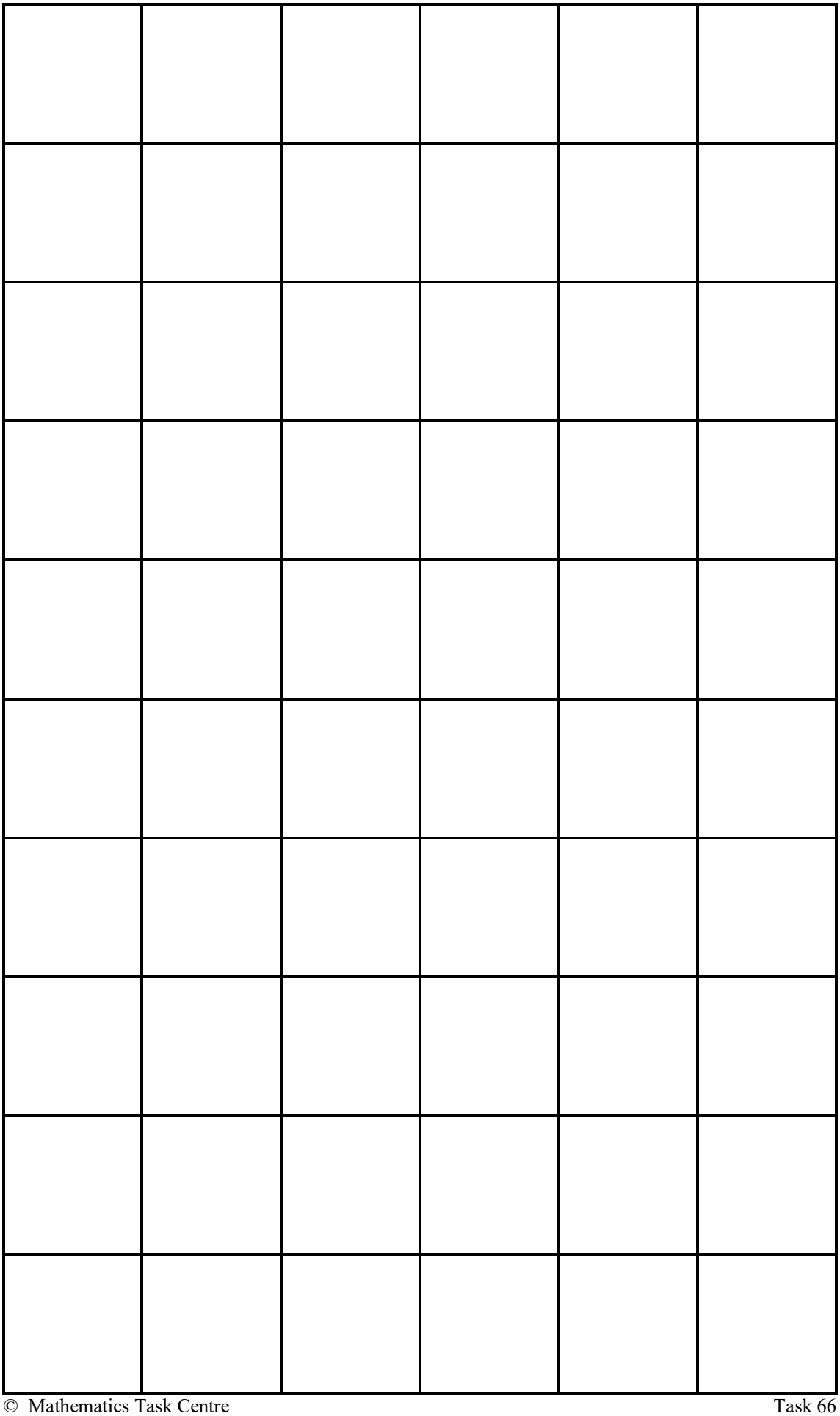
BATHROOM FLOOR



KITCHEN FLOOR



LOUNGE ROOM FLOOR



MAKING SOLIDS

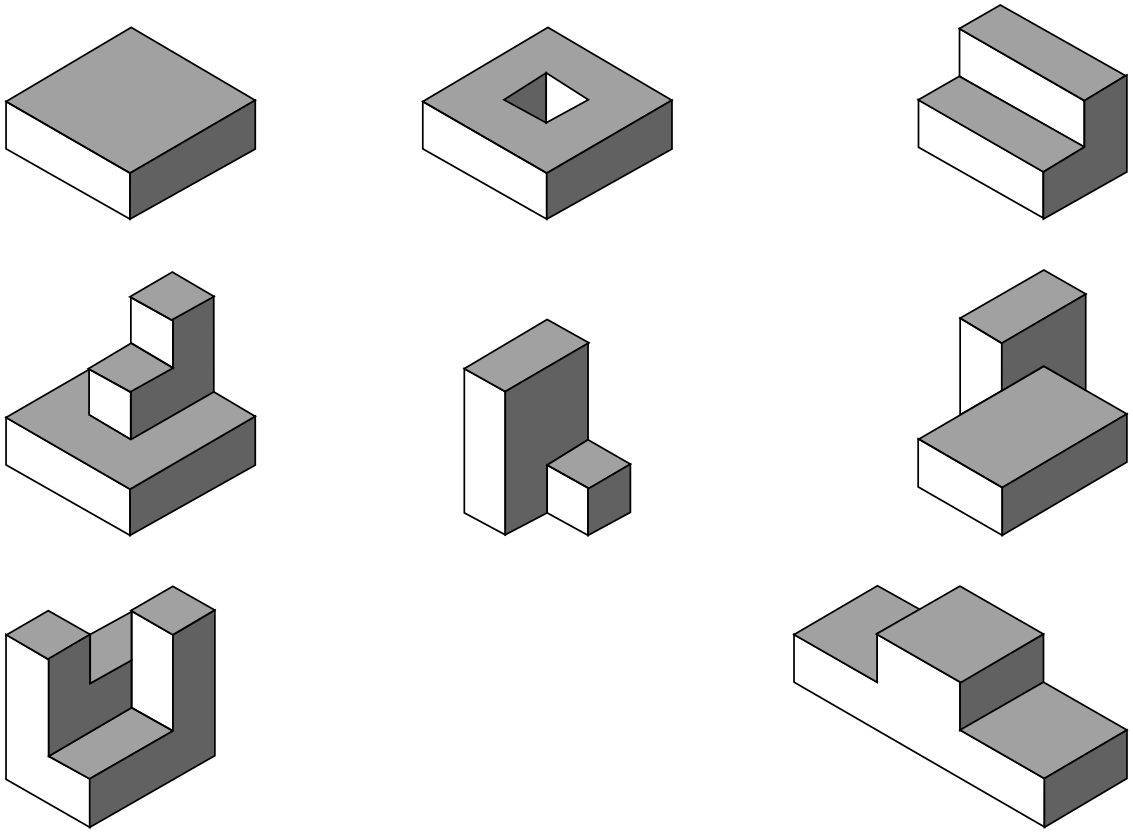
You Need

- Two [2] sets of an L, S and cube block - six [6] objects in total
- Recording sheet

Your Task

1. Make all the solids shown using some or all of the objects.
2. As you make each one, copy its drawing onto the recording sheet.

   Add lines and colour to show how the objects fit together.

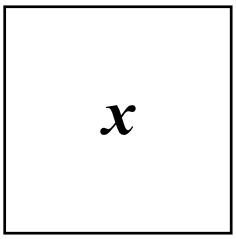


3. Use the single cube as a measuring unit to find the volume of each solid.

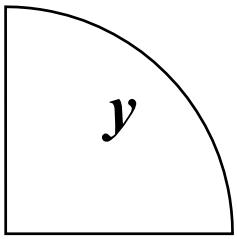
You Need

- One [1] panel of eight [8] TakTiles in a frame
- One [1] board, marking pen and cloth
- Recording sheet

If a square of this size has area x...



and a quadrant of this size has area y...



then this shape

is $x + 2y$.

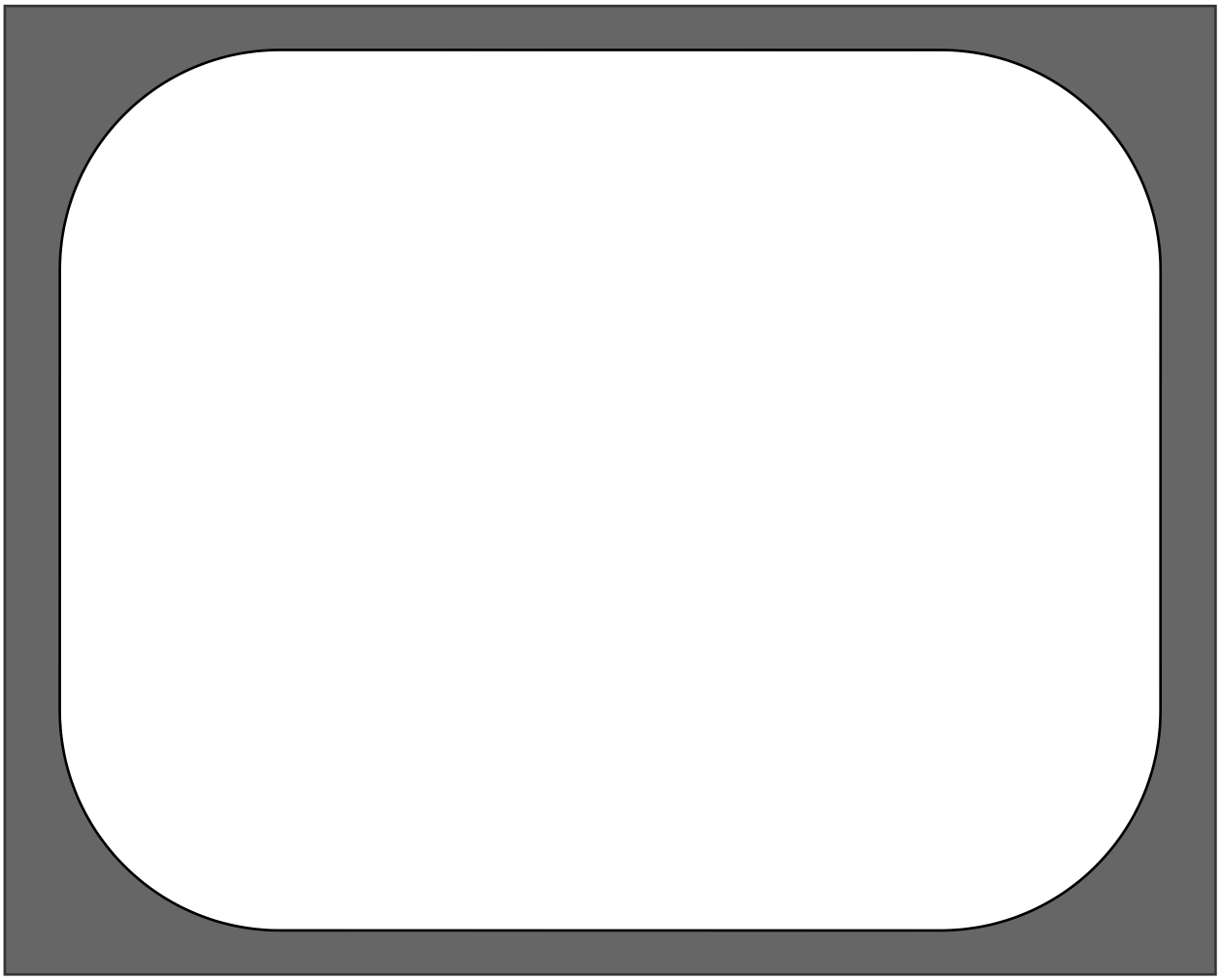
Your Task

1. Find the other shape which is also $x + 2y$.
2. Use x and y to find the area of the other shapes. Hint: One is $4x - 2y$.

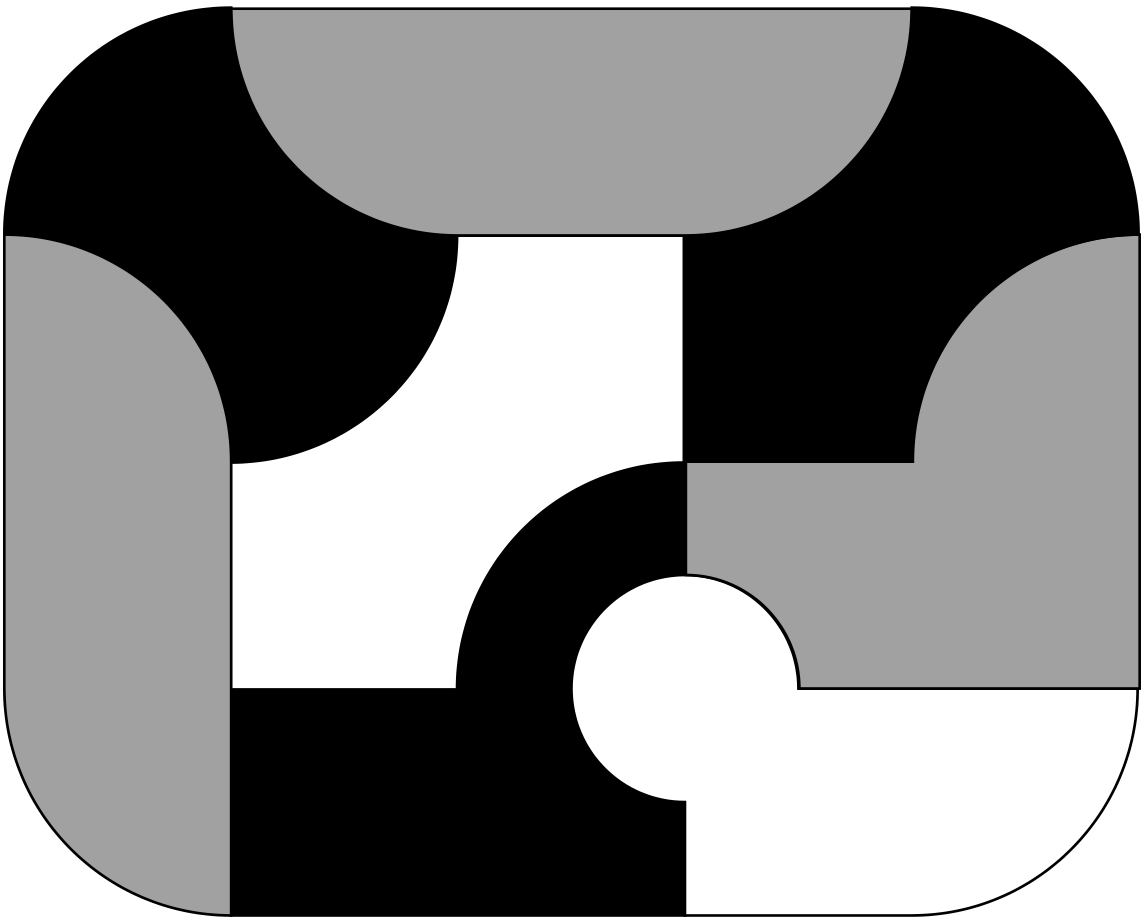
   Some shapes have a small quadrant. Assume its area is one quarter of y.
3. Now think about the empty frame.

   Think of its *inside* as *one whole piece*.

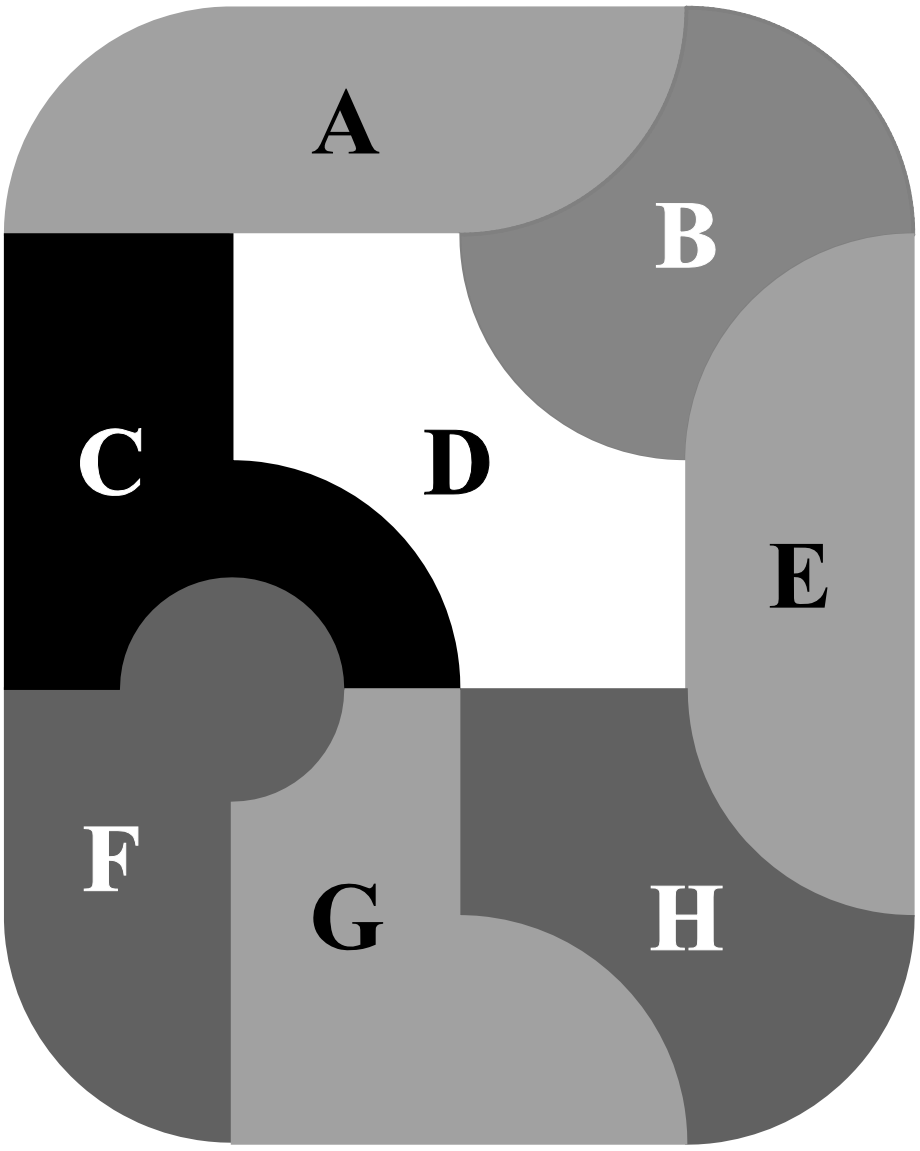
   Work out its total area using x and y.
4. Find the total area of the 8 pieces and compare it to the area of the frame.



ALGEBRA THROUGH GEOMETRY: CAREFULLY CUT OUT FRAME AND 8 SEPARATE PIECES



Algebra Through Geometry



Shape A = $x + 2y$

Shape B = _____

Shape C = _____

Shape D = _____

Shape E = _____

Shape F = _____

Shape G = _____

Shape H = _____

IN THE BAG

You Need

- Four [4] shapes, each in its own frame
- One [1] panel of eight [8] shapes (Tak Tiles) in their own frame
- One [1] bag

Your Task

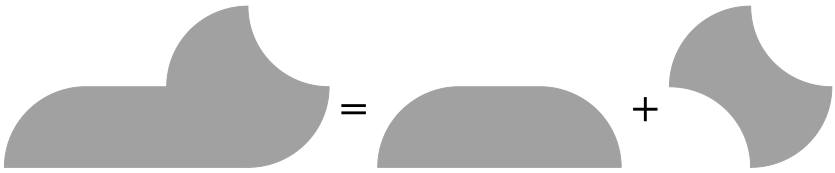
1. Remove one shape from its frame. Put the frame and shape in the bag.

   Just by feeling, put them together again in the bag.

   Repeat with the other single shapes.
2. Push two shapes from their frames and put all four pieces in the bag.

   Just by feeling, put them together again in the bag.

   Repeat with all four shapes and their frames in the bag.
3. Each single shape can be replaced by two [2] TakTiles. For example:



   Choose one single shape and replace it with TakTiles. Now place the frame and the two TakTiles in the bag and fit together just by feeling.

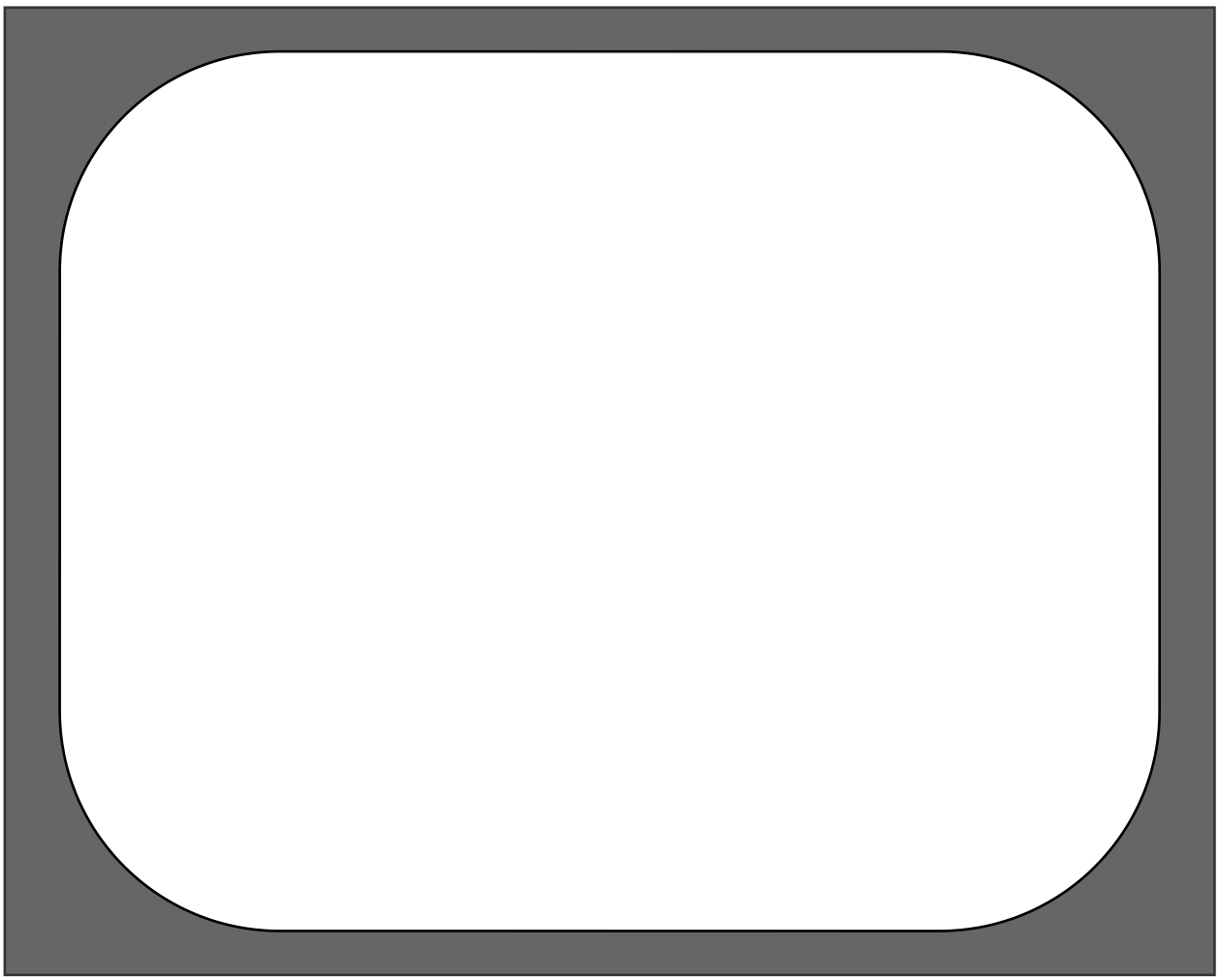
Challenge

4. Put *one* of the small frames and *all* the TakTiles into the bag.

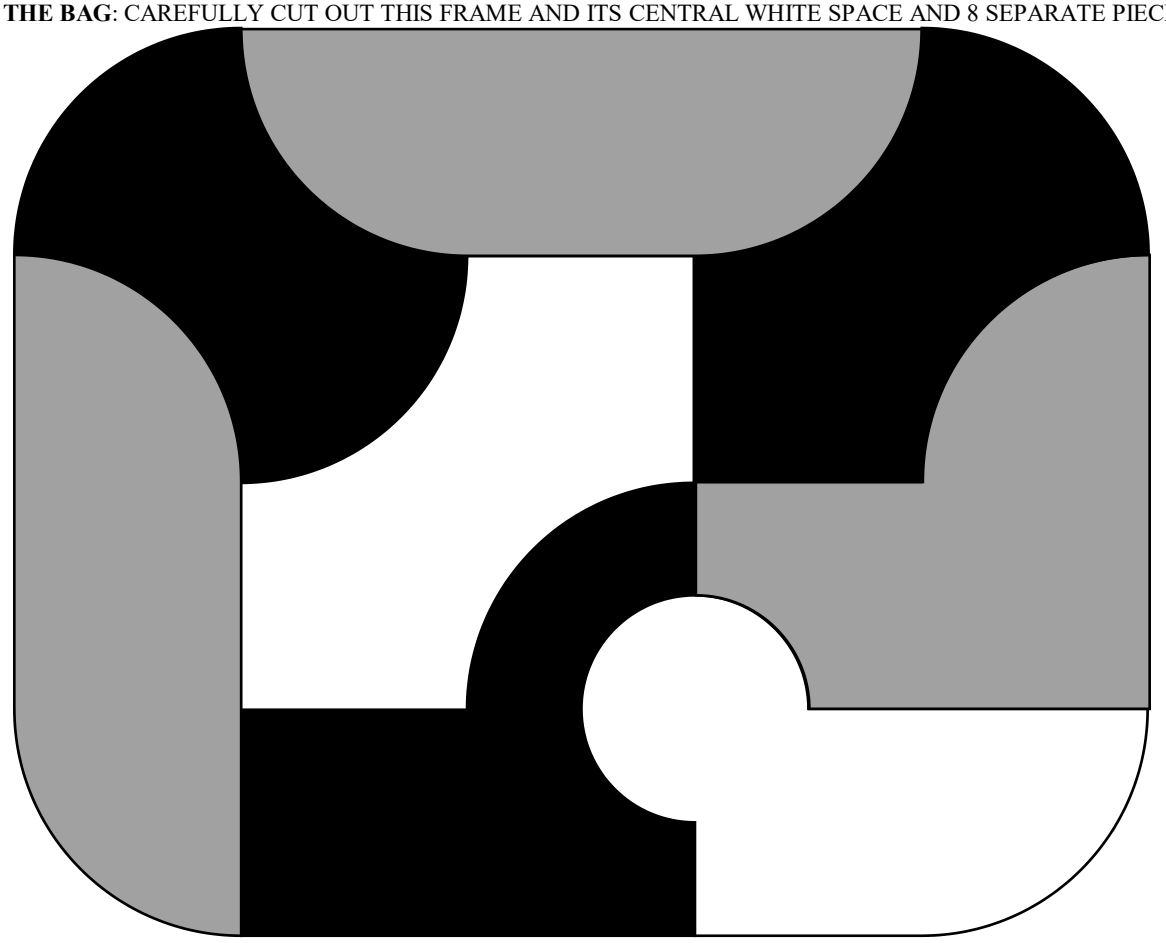
   Just by feeling, find the two shapes for the frame and fit them in it.
5. Put *all* the small frames and *all* the TakTiles into the bag.

   Just by feeling, fit everything together.
6. Take all 8 TakTiles from their frame, mix them up and spread them out.

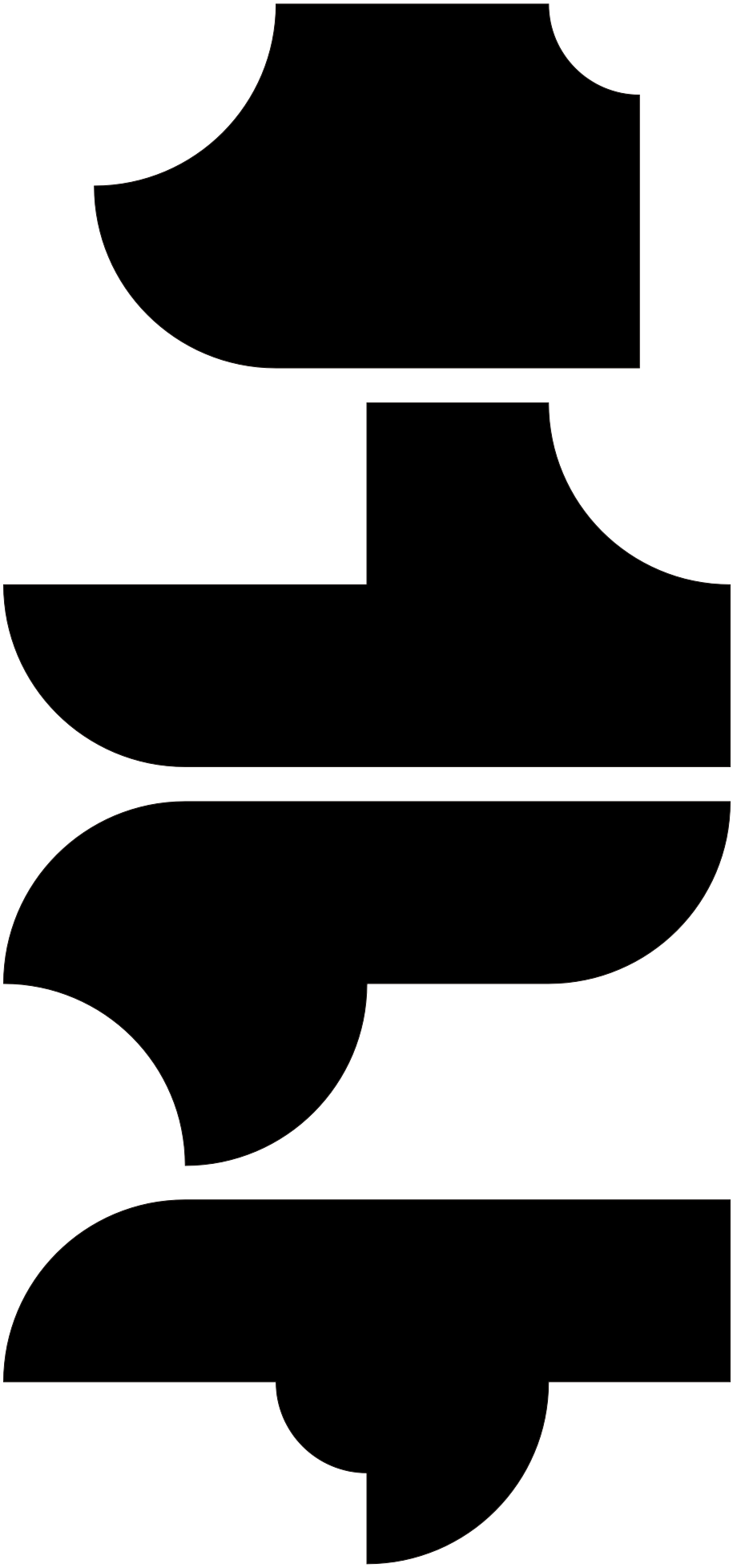
   Now put them back in their frame - firstly outside the bag, then in the bag.



IN THE BAG: CAREFULLY CUT OUT THIS FRAME AND ITS CENTRAL WHITE SPACE AND 8 SEPARATE PIECES

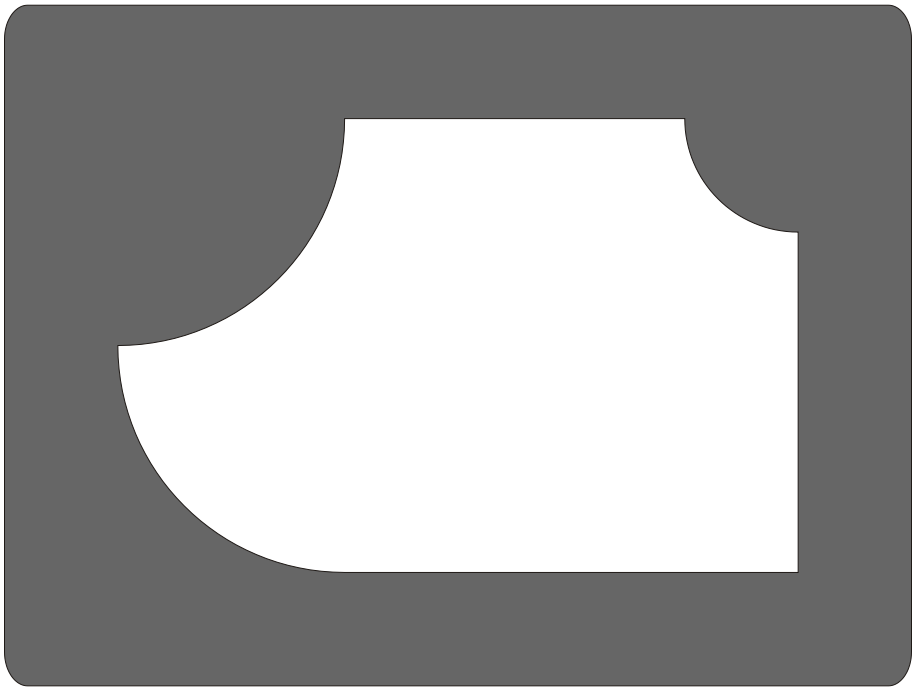


IN THE BAG: CAREFULLY CUT OUT THESE 4 SEPARATE PIECES



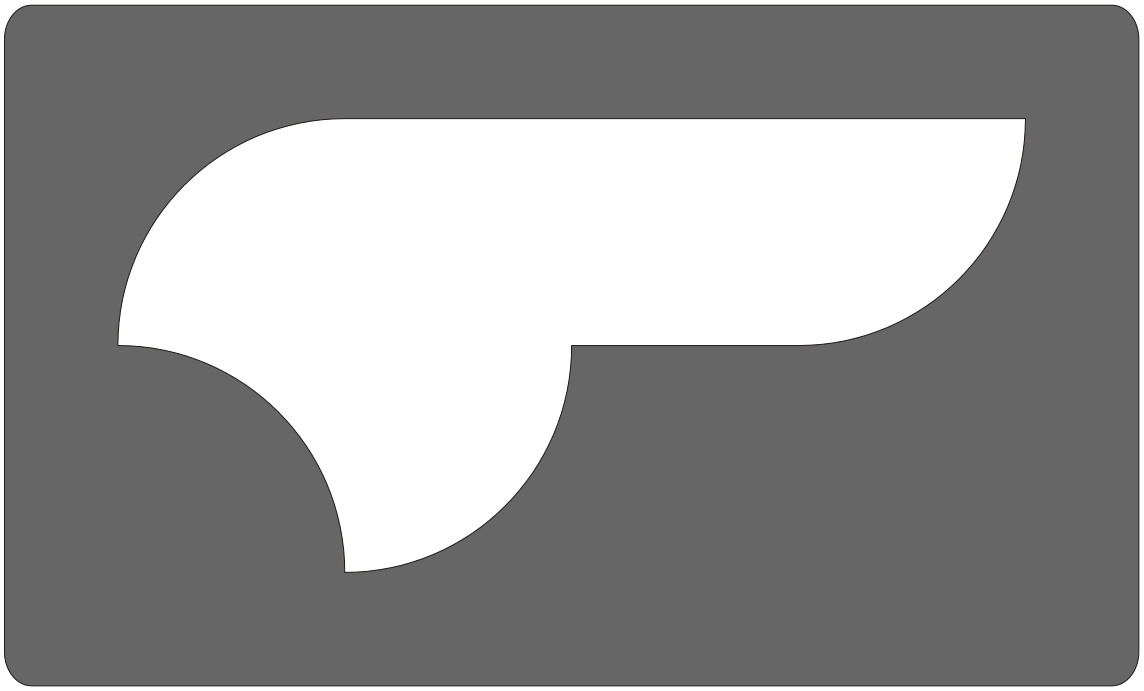
IN THE BAG

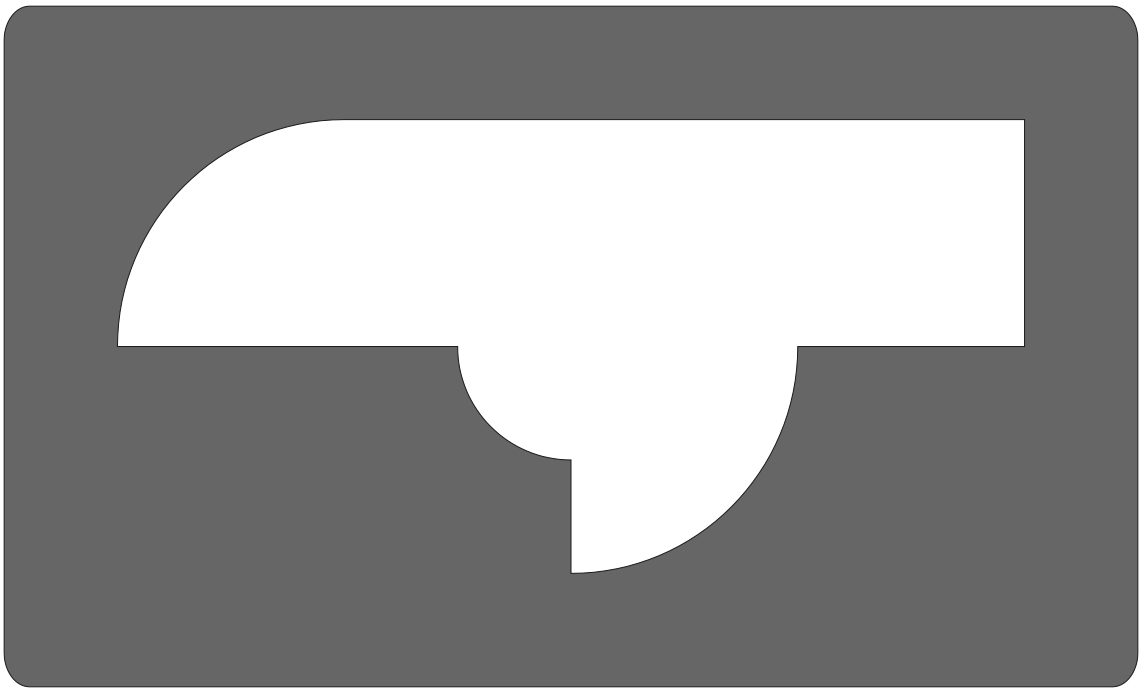
CAREFULLY CUT OUT THESE 2 FRAMES
AND CUT OUT THE CENTRAL WHITE SHAPE IN EACH ONE.



IN THE BAG

CAREFULLY CUT OUT THESE 2 FRAMES
AND CUT OUT THE CENTRAL WHITE SHAPE IN EACH ONE.



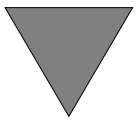


WHAT'S IT WORTH?

You Need

- Twenty [20] triangles and a recording sheet

Your Task

1. If  is worth 55¢, what is the value of  ?
2. Make and draw all the shapes worth \$2·20.
   How do you know you have found them all?
3. Make and draw all the shapes worth \$2·75.
   How do you know you have found them all?
4. Make and draw all the shapes worth \$3·30.
   How do you know you have found them all?
5. This symmetric shape is worth \$4·95.
   Make and draw all the other symmetric shapes with the same value.

Challenge

What happens if the starting shape is a square worth 55¢?

Repeat Questions 2 & 3.

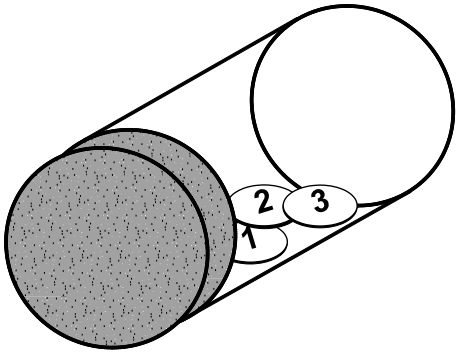
For a really big challenge try repeating Question 4 using the square.

TUBE TOSS

You Need

- One [1] tube containing three [3] numbered discs

In this game you pick up the tube, shake it, then put it down again on its side.



Your Task

1. Suppose you set up this game at the school fair and a player *wins if the 3 lands face up*.
   If each player has to pay $1 per game, what should you pay out for a win if you *aim to make no profit* - which is called breaking even?
2. What happens if a player wins when a *1 or a 2 or both land face up*?
   If each player has to pay $1 per game, what should you pay out for a win if you *aim to break even*?

Challenge

What happens if a player wins when *the total of the numbers facing up is 3 or more*?

What pay out do you give if you aim to break even?

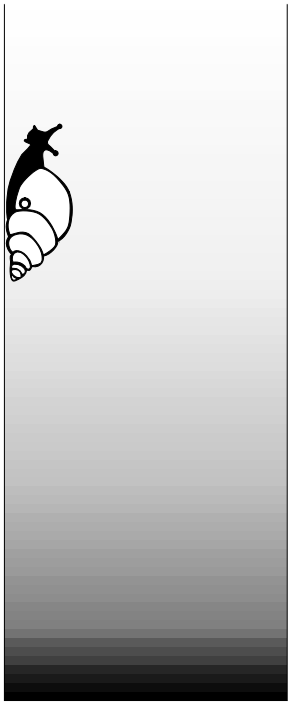
Create other ways to win and calculate their break even pay out.

SNAIL TRAIL

You Need

- One [1] block of wood with holes and a wooden dowel as a snail

The Story



A snail is at the bottom of an eleven [11] metre high well. It starts to climb the wall. In one hour it climbs five [5] metres, then it rests for one hour. While resting it slips down three metres.

Your Task

1. If this climbing pattern continues, how long will it take the snail to climb out of the well?

2. What happens if the snail is climbing *down* the well and continues the pattern of climbing down five metres in one hour, then resting for one hour during which it slips three metres.

   How long will it take to reach the bottom?

3. A different snail climbs six [6] metres in one hour and slips four [4] metres in each resting hour.

   Predict, then check whether this snail gets out of the well quicker.

Challenge

4. In Question 1 the snail reaches the top exactly at the end of a whole number of hours. Try to find another combination of climb and rest that would make the snail reach the top in a whole number of hours.

RACETRACK

You Need

- One [1] mirror, felt pen and cloth
- Three racetrack boards and a recording sheet

Your Task

1. Use Racetrack One. Ask your partner to hold the mirror and this card so you can only see the track in the mirror. Try to draw from Start to Finish by *only looking at the reflection of the track in the mirror*.
2. Swap over and give your partner a turn.
3. Try again using Racetrack Two and Racetrack Three.

Challenge

They're racing on Racetrack One.

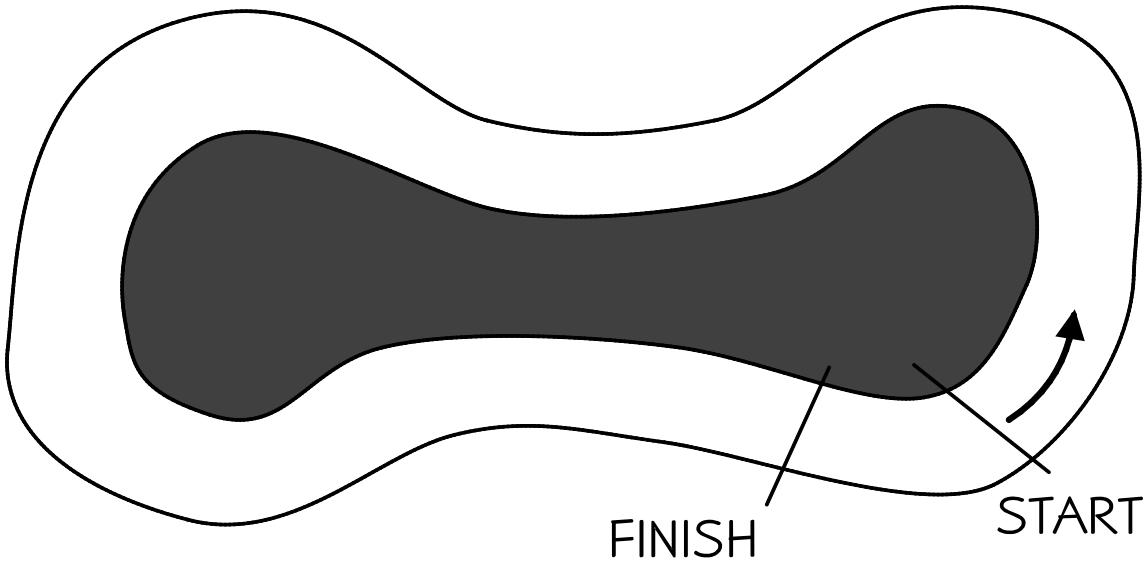
The challenge is to draw around the track in the fastest time:

- Your partner times you.
- You have three tries each.
- If the pen leaves the track you must *start again from that point, but the clock keeps running*.
- Record your times on the sheet.

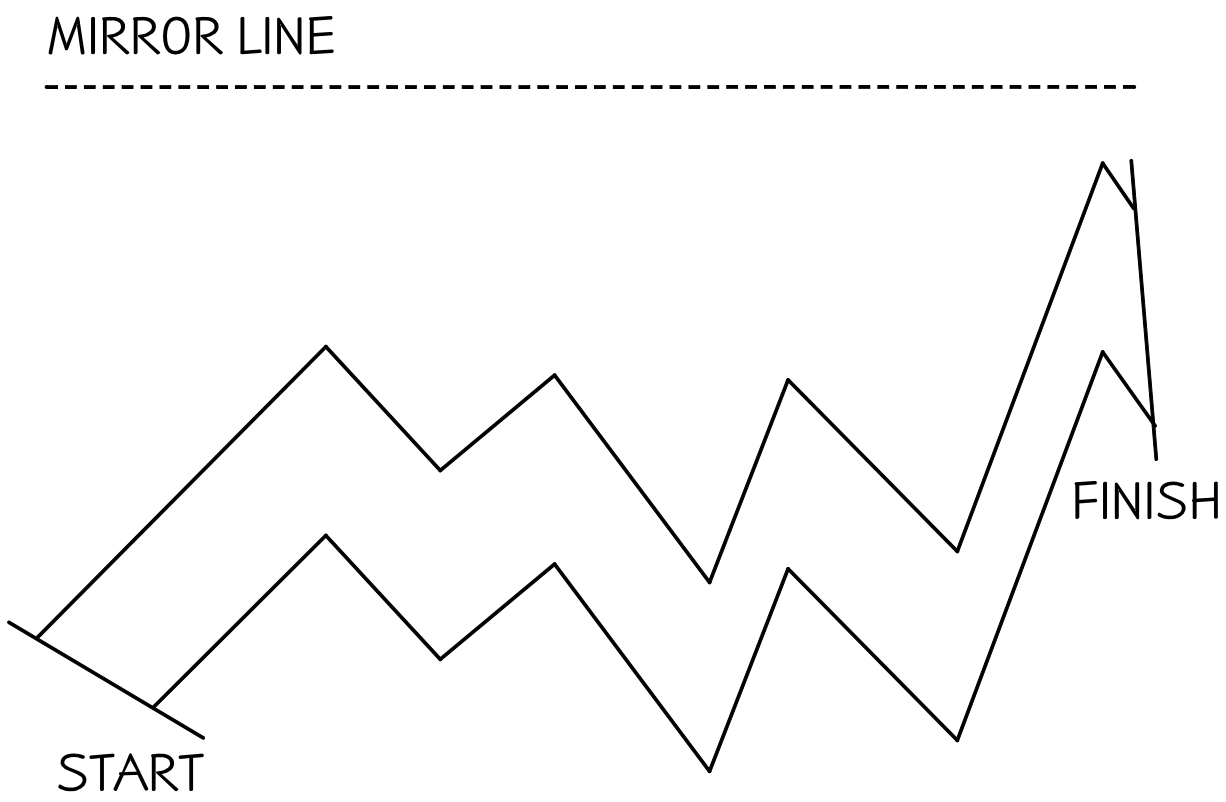
Try again using Racetrack Two and Racetrack Three.

Racetrack One

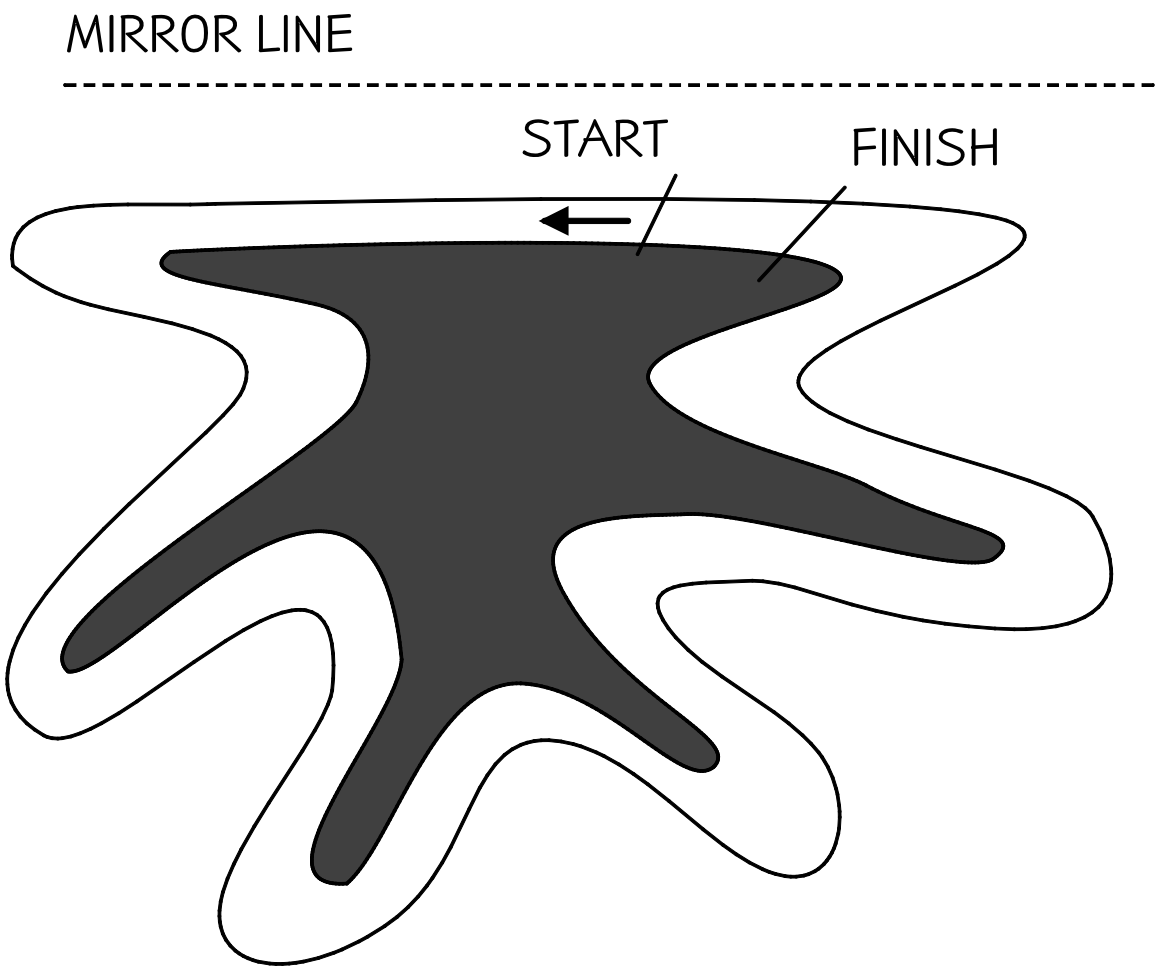
MIRROR LINE



Racetrack Two



Racetrack Three



RECTANGLE NIGHTMARE

You Need

- Five [5] shapes shown below and one [1] rectangle
- One [1] frame

Your Task

 = 1 unit

1. The rectangle is worth one unit of area.

   Work out the area of each shape.

2. Find the total area of the five shapes.

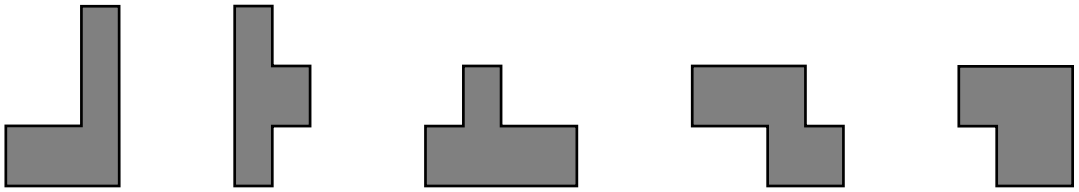
3. Fit the five shapes into the frame.

   Hint: The shapes in the picture *do not* have to be turned.

4. Now fit all six [6] pieces into the frame.

   (Yes it can be done.)

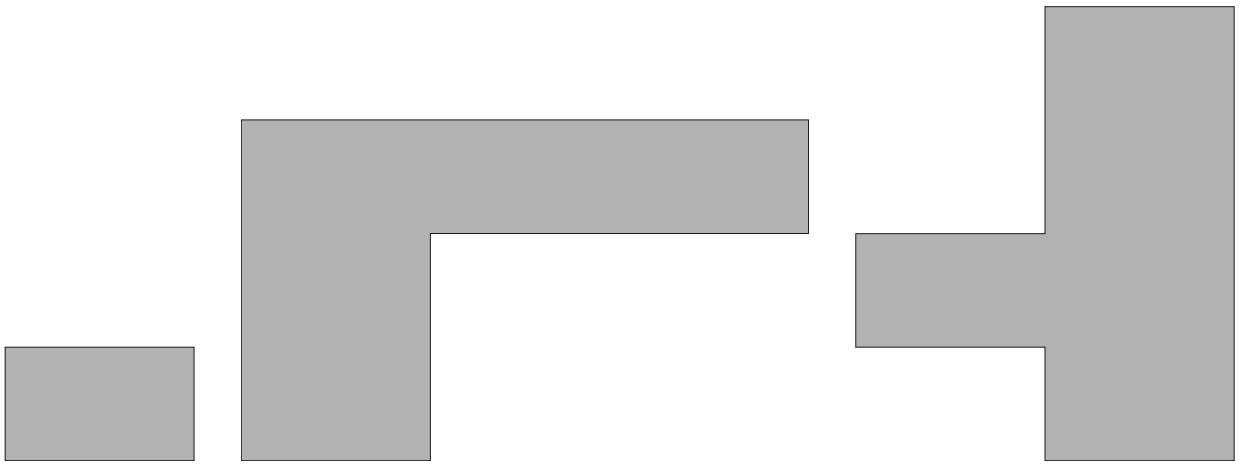
5. What is the total area of the inside pieces now?

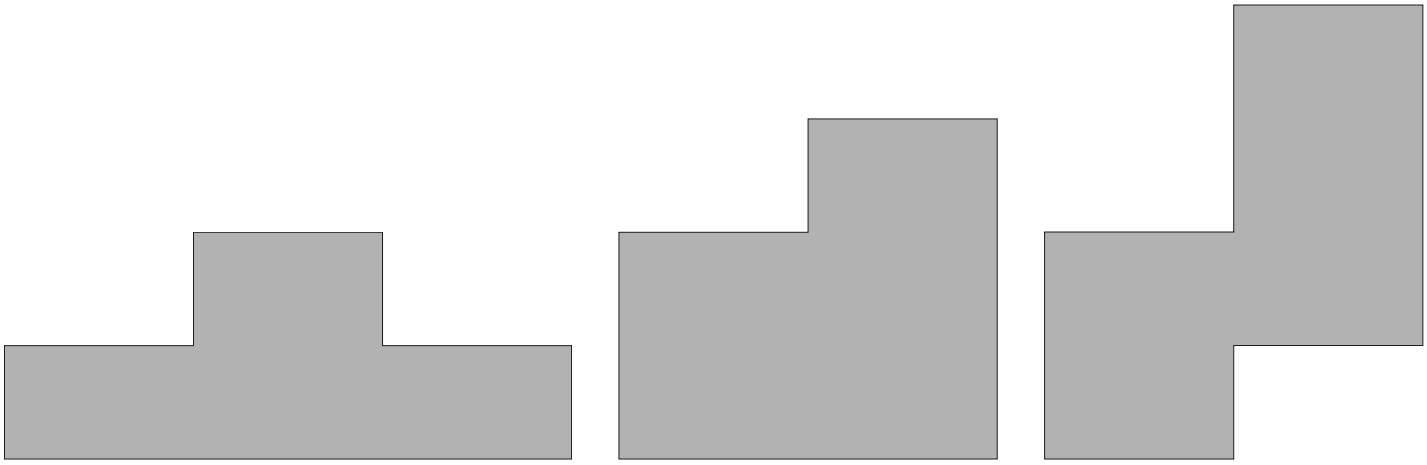


Challenge

The area inside the frame appears to be both 24 units and 25 units. Your challenge is to explain this paradox.

RECTANGLE NIGHTMARE: CAREFULLY CUT OUT THIS FRAME AND 6 SHAPES





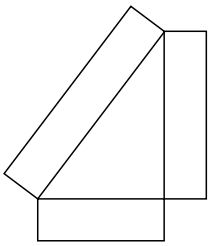
PYTHAGORAS RODS

You Need

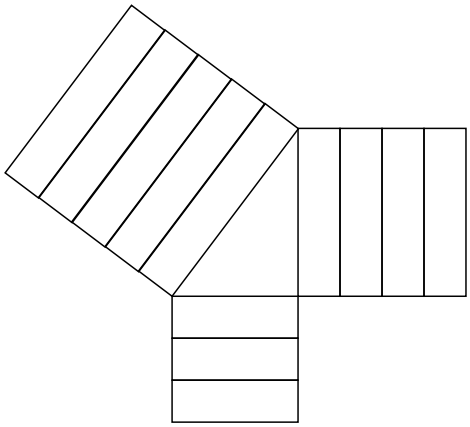
- Three [3] light green rods, four [4] pink rods, five [5] yellow rods, six [6] dark green rods, eight [8] brown rods, ten [10] orange rods

Your Task

1. Measure and record the length of each colour rod.
2. Make a right angled triangle like the drawing using the 3cm, 4cm and 5cm rods.



3. Build a square on each side of the triangle like this:



4. Work out the area of each square.
   Are the sizes connected?
   Record what you notice.
5. Find three different ways of placing the two smaller squares on top of the larger square to demonstrate that:
   $3^2 + 4^2 = 5^2$

Challenge

The section above demonstrates Pythagoras' Theorem. Pythagoras was a mathematician in ancient Greece. He noticed that the area of the two smaller squares together equals the area of the largest square.

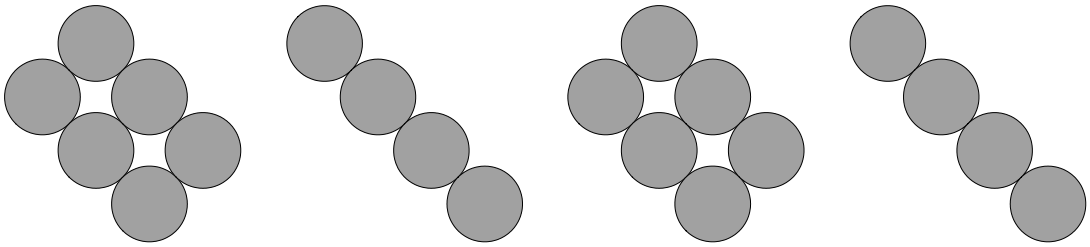
- Test Pythagoras' Theorem for a (6, 8, 10) triangle.
- Test Pythagoras' Theorem for a (5, 8, 10) triangle.
- Explain what must be true for Pythagoras' Theorem to work.

PYRAMID PUZZLE

You Need

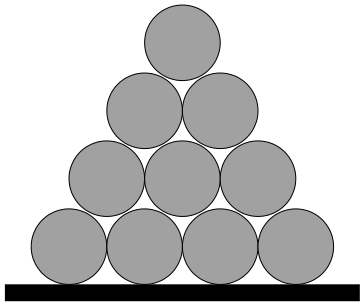
- Two [2] sets of four [4] pieces made from spheres as shown

Your Task

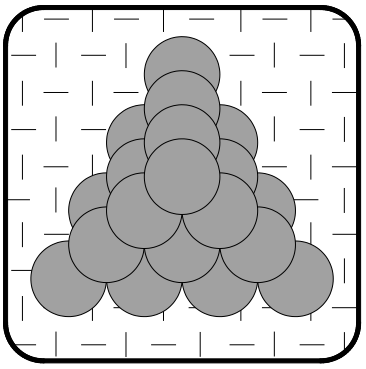


1. Use these four pieces to build a triangular pyramid.

   This is also called a tetrahedron.



SIDE VIEW



TOP VIEW

2. How many spheres in each layer? How many spheres in total?
3. Imagine a 5 layer tetrahedron.

   How many spheres in the bottom layer? How many spheres in total?

Challenge

How many spheres are needed to make a 10 layer tetrahedron?

FOUR BEAD MIX

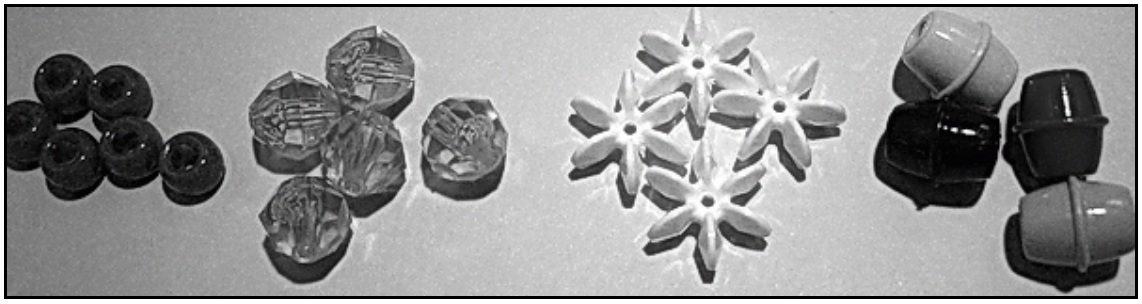
You Need

- Four [4] bags of beads, one [1] extra bag and a mat to sort beads

The Story

Bead-the-Best is a company that packs beads for necklaces.

They use beads like this...



(The ones you have may be different shapes.)

If beads are packed in the ratio of 3:4:5:6, that means,
for every 3 As in the pack there are 4 Bs, 5 Cs and 6 Ds.

Bead A	Bead B	Bead C	Bead D
3	4	5	6

Your Task

1. Pack the bag so there are 180 beads in the following ratios:
   (a) 3:4:5:6 (b) 1:3:4:1 (c) 2:3:6:7 (d) make up your own ratio
2. If the ratio of beads in the bag had to be:
   (a) 1:3:5:2 (b) 3:5:3:4 (c) 3:4:6:6
   how many beads could be in the bag in each case?

RECTANGLE OF SQUARES

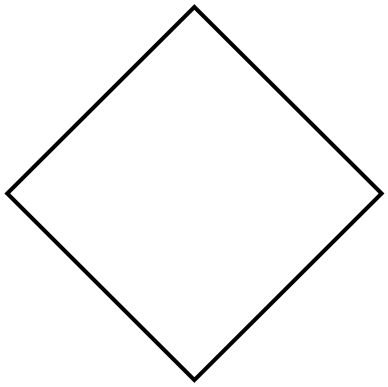
You Need

- Nine [9] squares numbered
  1, 4, 7, 8, 9, 10, 14, 15 , 18

The number on the square is the length,
in centimetres, of each of its sides.

Your Task

1. Fit all nine squares together to make a rectangle.



Hint
One side
of the
rectangle
is 33cm.

2. In your journal record:
   - the way the pieces fit together.
   - the perimeter and area of the rectangle.
   - two ways to calculate the area of the rectangle.

TOWER OF HANOI

You Need

- One [1] base with three [3] posts and five [5] discs

The Story

This puzzle is associated with a legend - a legend with many forms. One form is about a temple in India with three posts and sixty-four [64] discs. Brahmin priests have supposedly been moving the discs according to the rules ever since they were given the command in an ancient prophecy. The legend says that when the last move is made the world will end.

Rules

- Move one disc at a time to a different post.
- Never put a larger disc on top of a smaller disc.

Your Task

1. At the start the discs are in order on one post
   ...largest on the bottom and smallest on the top.
   At the end the discs are in order on a different post
   ...largest on the bottom and smallest on the top.
2. Follow the rules to move your discs from one post to the another.

Challenge

If the priests could move one disc every minute, calculate the number of years it would take to move all 64 discs.

HEARTS AND LOOPS

You Need

- One [1] wire puzzle with two [2] linked parts - a heart shape and 'loop' shape

---

If the heart is attached, disconnect it.

If the heart is not attached, connect it.

Challenge

If the pieces are joined when you get the puzzle, you have to remove the heart from the loop.

If the pieces are separated when you get the puzzle, you have to join the heart with the loop.

Work together and take turns to use the equipment.

This is not a test of strength!

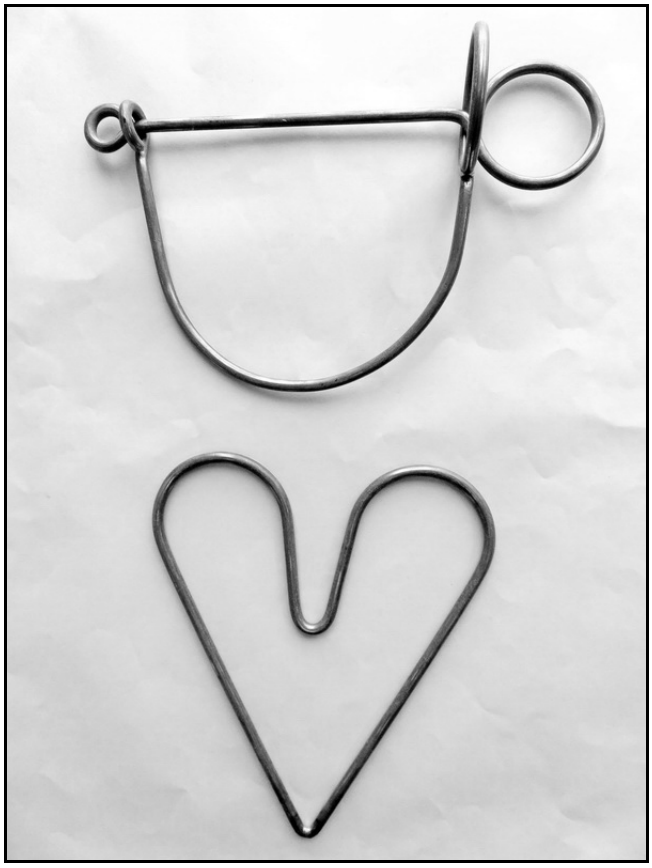
Do not force the pieces!

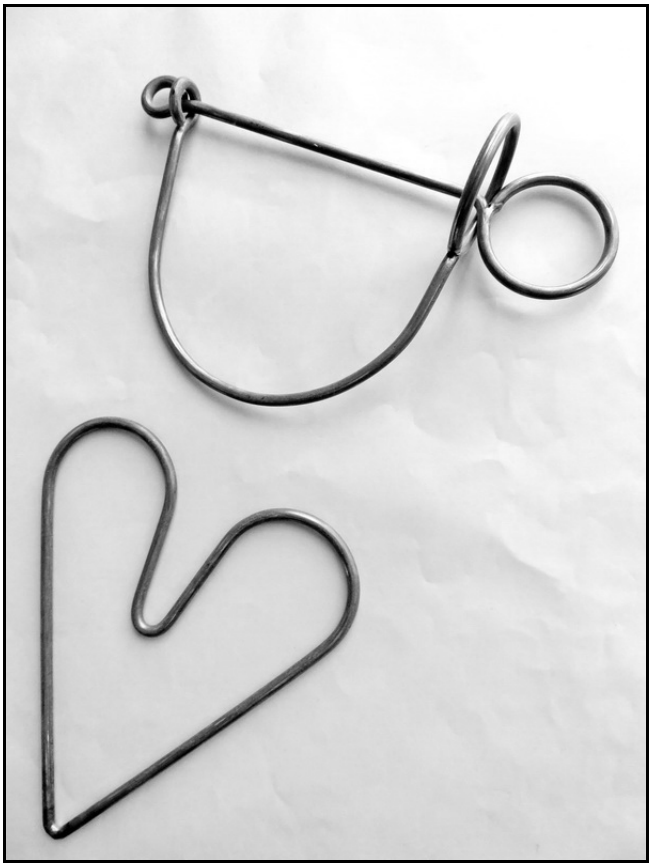
Do not bend the wire!

To demonstrate you have conquered the challenge, remove and replace the heart twice.

In your journal try to draw or write an explanation of how to separate the pieces.

Hearts & Loops Design





The two large circles in the loop are the same size and so are the two small circles.
The straight part of the loop can be thought of as a key in a lock.
The heart completes the lock when its inward curve is passed through the large loop of the bent part from along the straight line in such a way that the large loop of the key passes up (or down) through it and the key can be removed. The inward curve of the heart needs to be just long enough to allow this to happen - so the diameter of the large loop plus a bit.

HABERDASHER'S PROBLEM

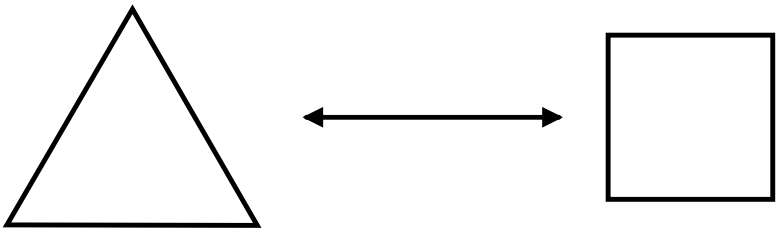
You Need

- Four [4] different shapes
  ...one [1] triangle and three [3] quadrilaterals

The Story

In the late 1800s, this puzzle became quite famous. It may have derived from the work of haberdashers (tailors) who had left over pieces of material and wanted to use them.

The challenge is to cut an equilateral triangle into



pieces that can be reformed into a square. Henry Ernest Dudeney solved this problem with four pieces. His solution is displayed in the Royal Society in London.

Your Task

1. Arrange the pieces into a triangle and then a square.

Challenge

Make the triangle. Then make the square from it, using only rotations about corners. Record the moves.

Haberdasher's Problem Template

The 4 pieces of Haberdasher's Problem are cut from an equilateral triangle as shown.
Printing on card and cutting will work, but the pieces will wear out.
If possible provide a craftsperson with the template for woodworking or laser cutting.

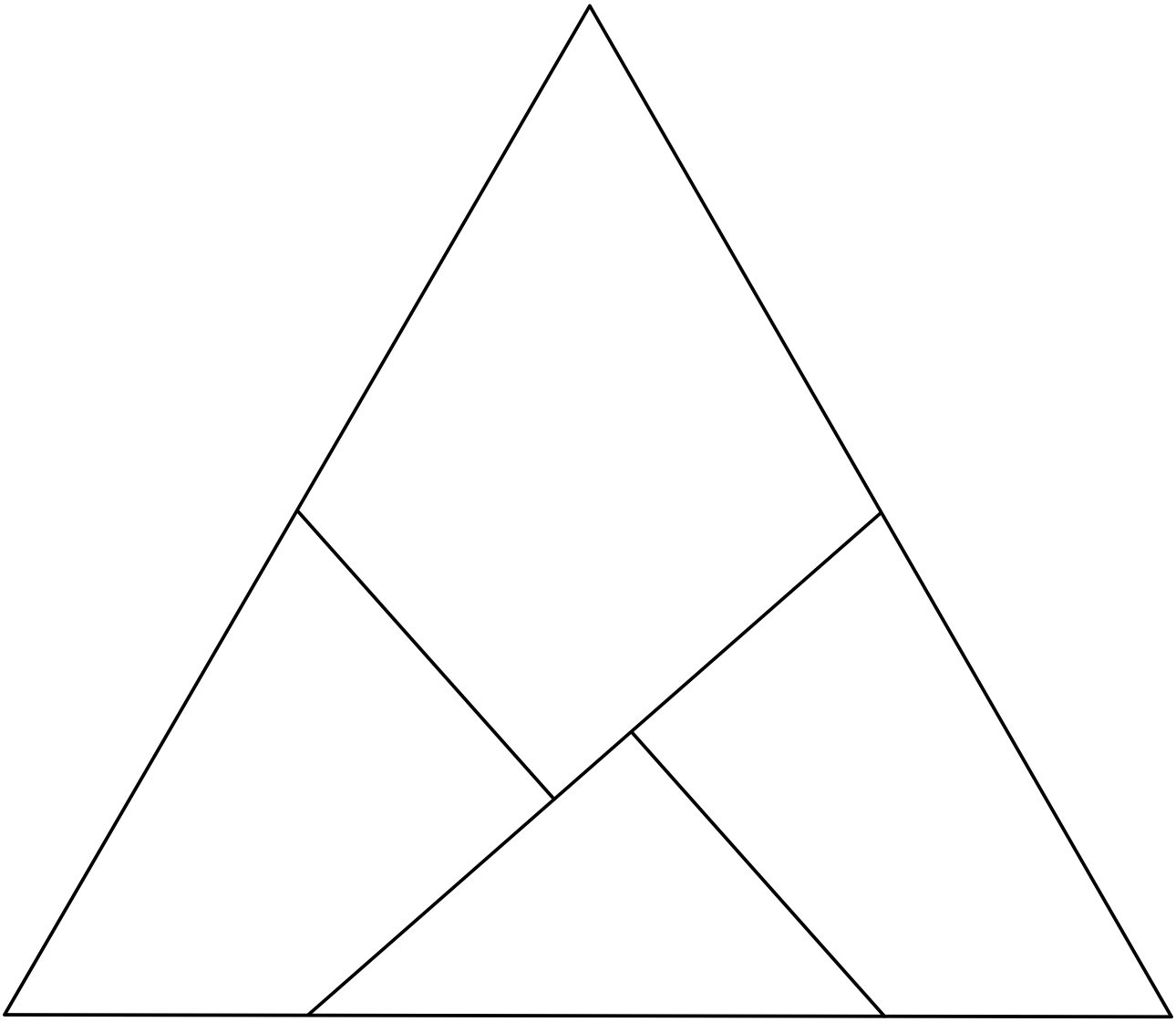


PHOTO ANGLES

You Need

- One [1] grid of sixteen [16] squares - each square is 4cm x 4cm
- Several geometric shapes and objects
- One photo of the pieces arranged on the grid
- One small tape measure

Your Task

1. Arrange the pieces as shown in the photograph.
2. Where was the camera situated?

   Give your answer as accurately as possible.

Challenge

Where was the light situated?

Give your answer as accurately as possible.

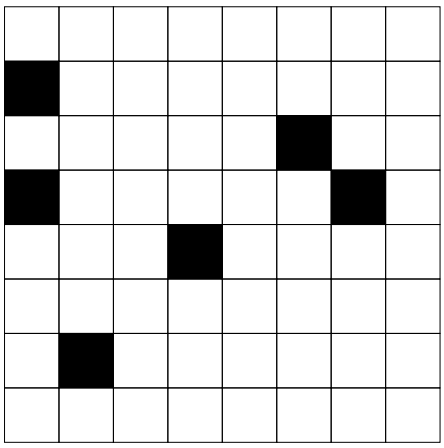
PHOTO ANGLES BOARD

PAVING VIEWS

You Need

- About forty [40] 2cm square tiles (same colour)
- 8 x 8 board

The Story



Sanja is an architect. She has designed four [4] skyscrapers around a large open plaza. There is one skyscraper on each side of the plaza and she wants the view from each building to be the same. She has ordered large tiles to pave the plaza and so far this is the view.

Your Task

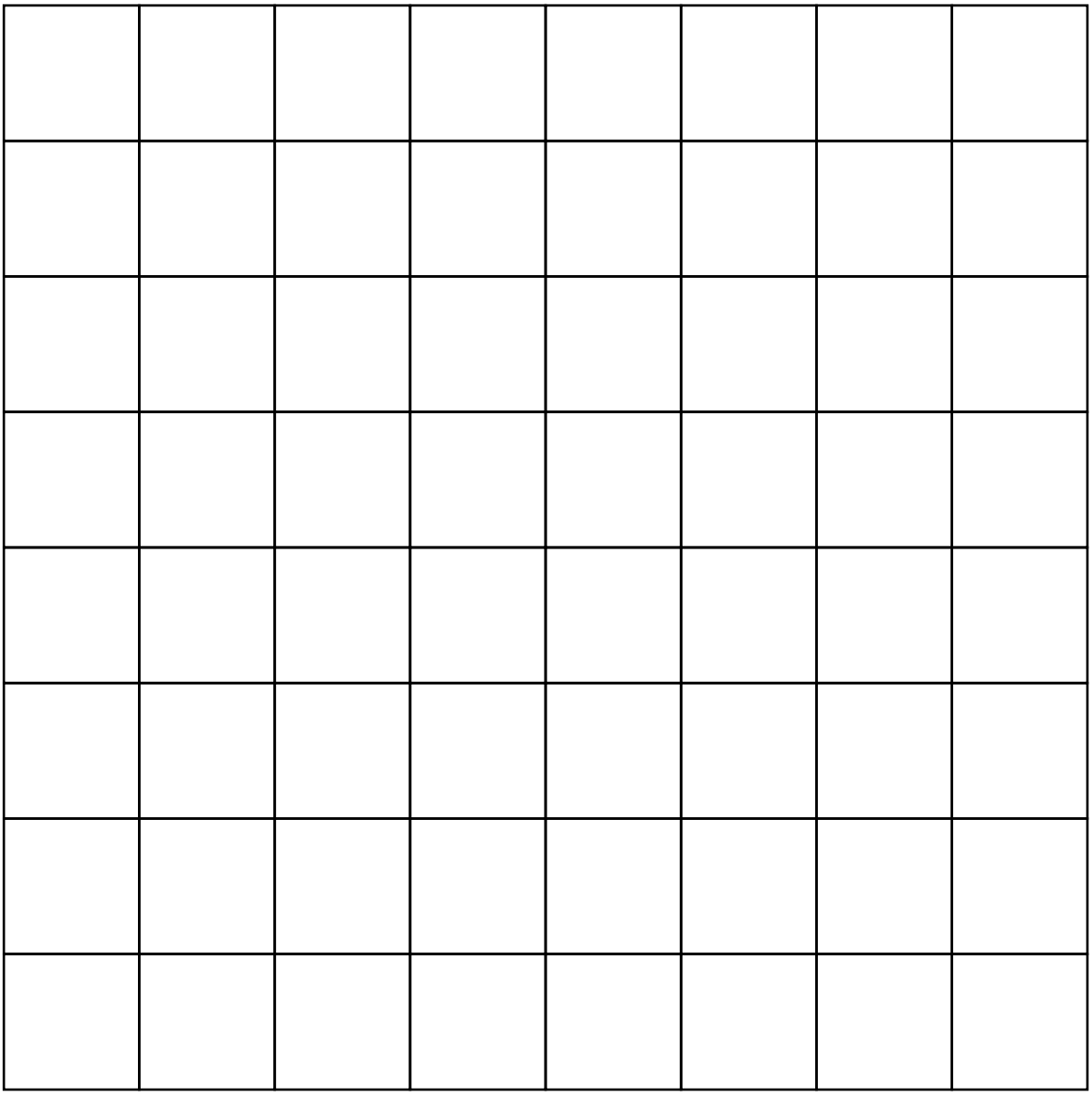
1. Place the tiles on the board as shown in the picture.

Challenge

Place the minimum number of extra tiles on the board so Sanja can visit all her buildings and look down on the same view.

Hint: When you are correct, you will be able to turn the board in quarter turns and see the same view each time. This is called rotational (or point) symmetry.

PAVING VIEWS BOARD



BRICK WALLS

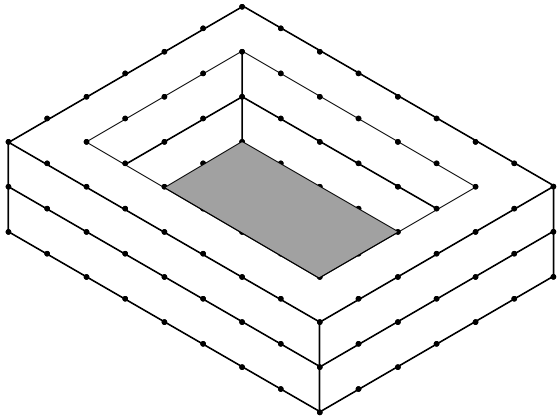
You Need

- At least forty-eight [48] construction bricks

Each brick is made of two cubes.
The dots on the picture show cubes, not bricks.

Your Task

1. A farmer wants to build this brick yard for the animals. Build it first then count the number of bricks it takes.
2. In the summer the animals are in the paddocks, so the farmer decides to pack the yard full of spare bricks.



   - Guess the number of bricks he can store.
   - Check your guess by building one layer that exactly fits on the bottom.
3. The farmer discovers he can fill the yard and have enough bricks left to build a new wall. The new wall exactly fits around the outside of the yard.
   - How many bricks did he need to build it?

PAINTED CUBES

You Need

- Three [3] cube blocks of different sizes
- Board, marker and wiping cloth

The Story

The markings suggest the large cubes are made from unit cubes. If the large cubes are spray painted all over, some unit cubes will have more surfaces painted than others.

Your Task

1. Calculate the number of unit cubes needed to build the Size 3 cube. Can you check it another way?
2. If the Size 3 cube is spray painted:
   - How many unit cubes would have three faces painted?
   - How many unit cubes would have two faces painted?
   - How many unit cubes would have one face painted?
   - How many unit cubes would have zero faces painted?
3. Enter your answers in the table. They should total 27.
4. Repeat the task for the two [2] larger cubes.

Challenge

Calculate the results for Size 10. (Look for patterns.)

Explain in your journal how you worked it out.

Painted Cubes

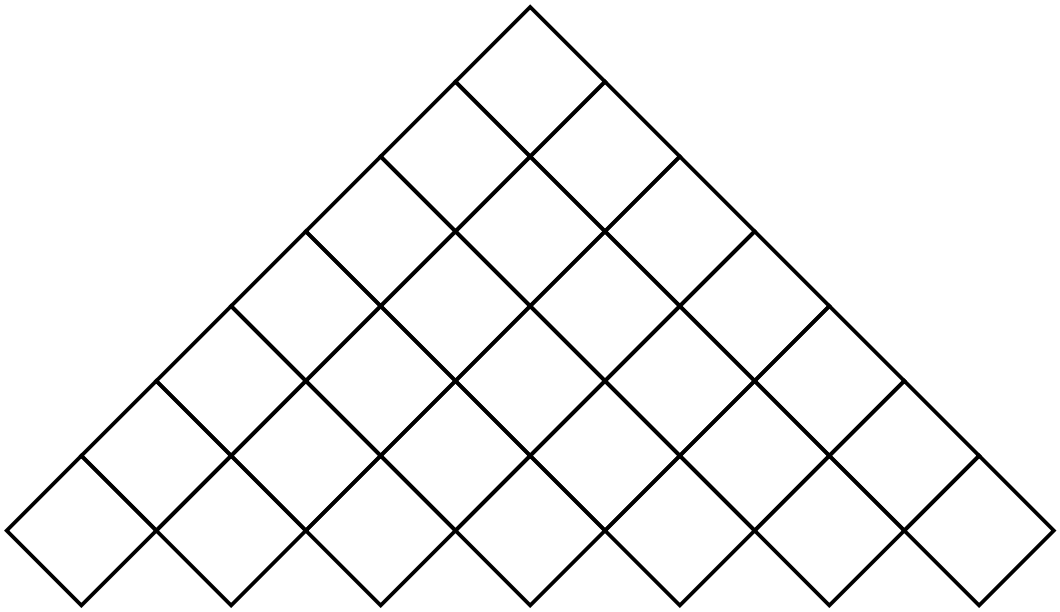
	Unit cubes with ... painted faces				
Size of Large Cube	3	2	1	0	Total
3					
4					
5					
6					
7					
8					
10					
n					

SYMMETRIC TILES

You Need

- Twenty-eight [28] tiles - Colour A one side, Colour B the other
- One [1] playing board and a recording sheet

Turn the playing board so it looks like this:



In every question, including the Challenge
you must use twelve [12] tiles Colour A up.

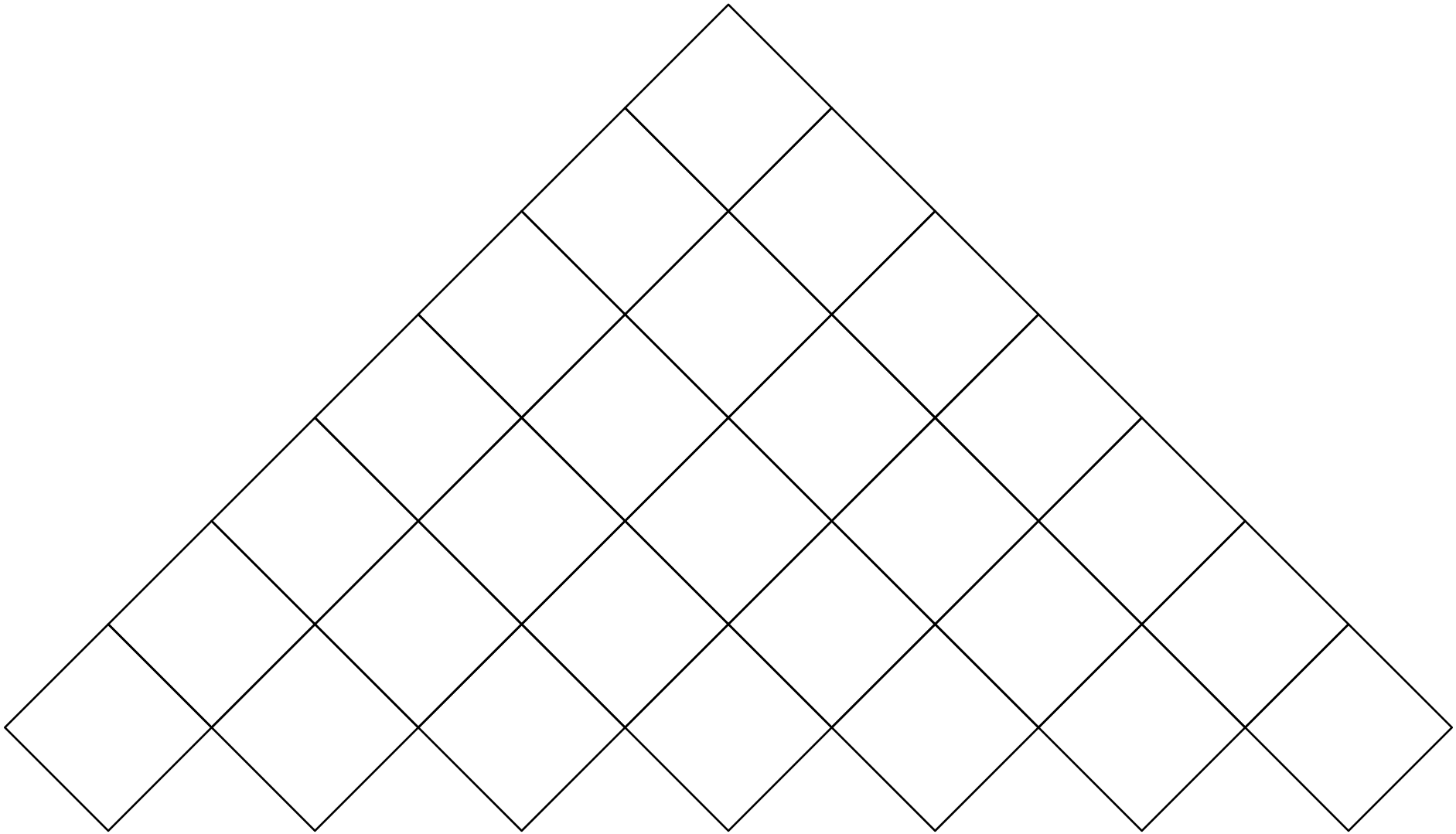
Your Task

1. Use all twenty-eight [28] tiles to make a symmetric design.
   Record your design on the sheet. (Remember 12 are Colour A up.)
2. Make and record two more symmetric designs using *all* the tiles.

Challenge

Use *all* the tiles to make a special symmetric design with the twelve [12] Colour A tiles arranged in six [6] lines of four [4].

Symmetric Tiles Board



CHANGE

You Need

- Play money coin collection:
  one [1] x $2, two [2] x $1, four [4] x 50¢
  ten [10] x 20¢, twenty [20] x 10¢, forty [40] x 5¢

Your Task

1. Find at least ten [10] different ways to make $2 worth of coins.

Challenge

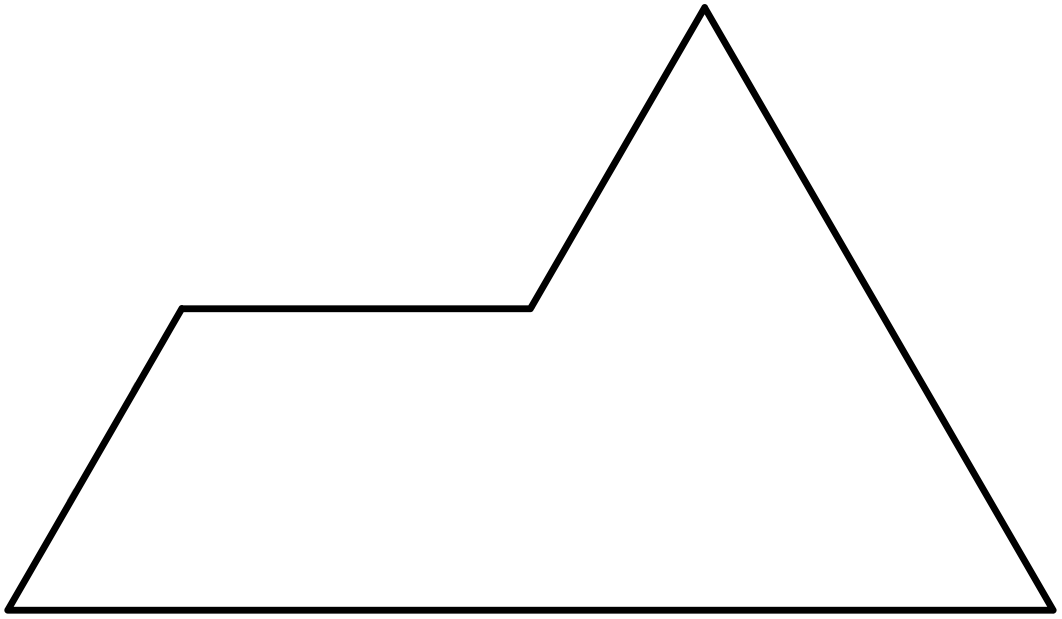
How many ways are there altogether to make $2 worth of coins?

How do you know when you have found them all?

SPHINX

You Need

- Eight [8] sphinx pieces - four [4] pieces each

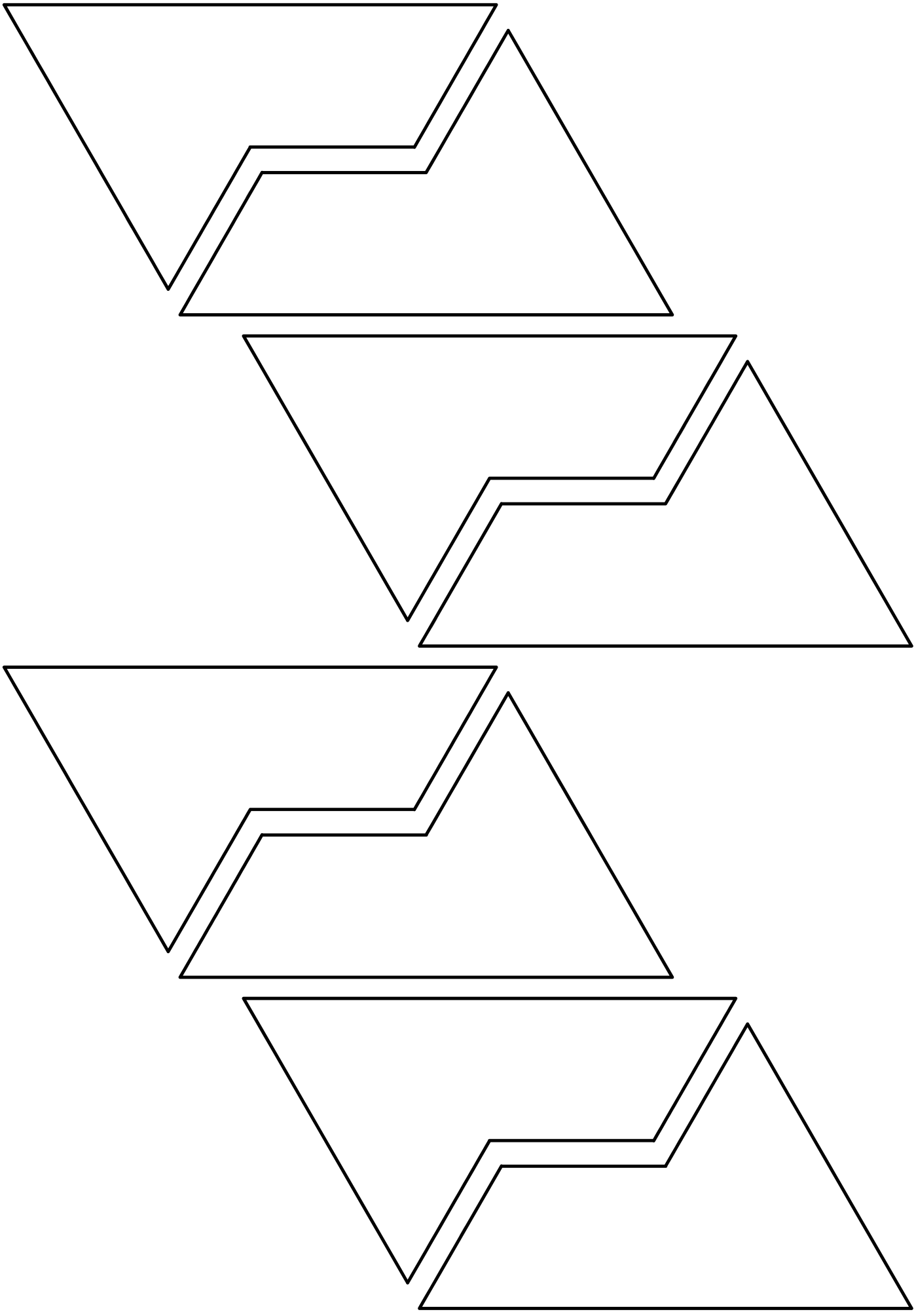


This shape is called a Sphinx.

Your Task

1. Put four sphinx pieces together to make one [1] larger sphinx shape.

2. The area of the new Size 2 sphinx is four times the area of the Size 1 Sphinx.
   How much bigger is its perimeter?



SLIDING TILES

You Need

- One [1] frame with six [6] spaces and five [5] square tiles
  Tiles are labelled **W T O N I** on one side and **5 4 3 2 1** on the other.
- One cube dice

Your Task

1. Arrange the letter tiles at random in the frame.

   There are six [6] places so you could use the dice to help you do this.

2. Your challenge is to slide the tiles within the frame - no picking them up - so that you reach this winning arrangement:

   W O N

   I T __

3. Is it always possible?

   What are your chances of success from a random start?

   Do ten [10] experiments to get an idea.

4. Start with the number tiles arranged like this:

   2 3 4

   1 __ 5

   Is it possible to shift them to this position?

   4 3 2

   5 __ 1

5. Arrange the number tiles at random in the frame.

   Do ten [10] experiments to get an idea of your chances of sliding to the first arrangement in Question 4.

Challenge

Is it possible to look at the starting arrangement and predict whether you can succeed or not in Question 5?

MAKING FRACTIONS 2

You Need

- One [1] set of sixteen [16] blocks - one each of the biggest and second biggest, two [2] of the next size, four [4] of the next size and eight [8] of the smallest size
- Board shown in the picture, marker and wiping cloth

Your Task

1. Arrange one block of each size in order from biggest to smallest.
2. Sketch a picture of each shape in order along the top row of the board.
3. In Row 1 the biggest piece is worth 1.
   Write the value of each of the other pieces along Row 1.

Making Fractions 2

ROW 1	1				
ROW 2		1			
ROW 3			1		
ROW 4				1	
ROW 5					1

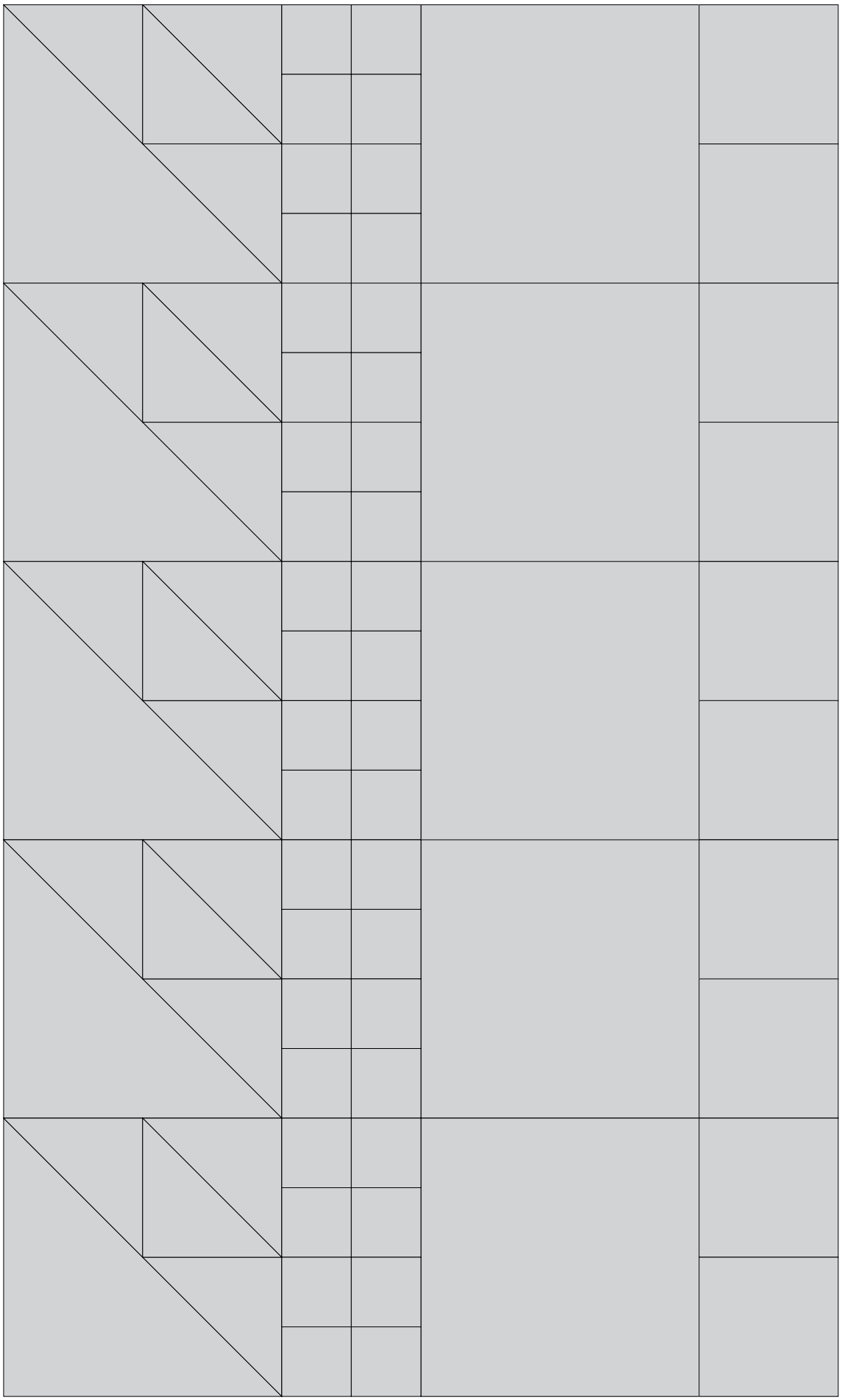
4. In Row 2 the second biggest piece is worth 1.
   Write the value of each of the other pieces along Row 2.
5. Continue filling in Rows 3 to 5 the same way.
6. Copy the table into your journal and write about any patterns you see.

Challenge

Start the task over again, but this time the chosen piece in each row costs $1 to make. Work out the cost of making each of the other pieces in that row. Record in your journal.

Making Fractions 2

ROW 1	1				
ROW 2		1			
ROW 3			1		
ROW 4				1	
ROW 5					1

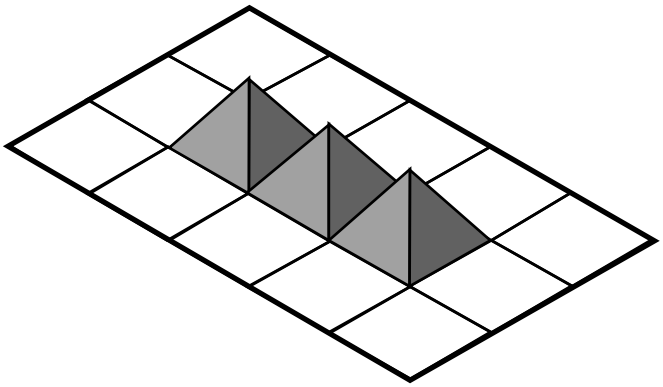


Task 177, Making Fractions 2 Print on thick card or make from plywood. This master produces 5 sets.

POINTY FENCES

You Need

- Ten [10] squares, eight [8] triangles and a recording sheet



The Story

Sharp-As-A-Tack fence company makes pointy fence tops like these to stop people climbing over. This is a Number 3 fence top.

- Each face of the pyramid is made from one triangle.
- The surrounding tiles are square.

Your Task

1. Make the Number 1 and Number 2 fence tops.
   How many tiles (square and triangular) are needed?
2. For other size fence tops up to Number 5 work out how many tiles would be needed in each case. (If you need to, use the recording sheet to sketch.)
3. Record the answers to Questions 1 and 2 in your journal.
4. How many tiles are needed to make a Number 10 pointy fence top?

Challenge

How many tiles are needed to make a Number 100 pointy fence top?
If I tell you any size fence top, explain how to calculate the number of tiles.

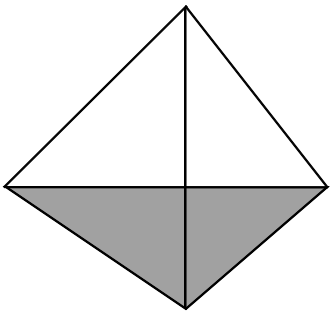
- What happens if I don't understand your explanation?
- Find at least one other way to explain it to me.

TETRAHEDRON TRIANGLES

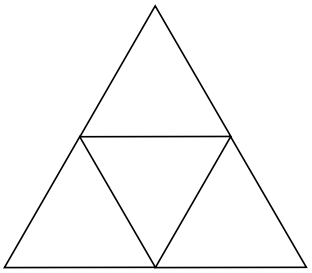
You Need

- Sixteen [16] click together triangles and a recording sheet

Your Task



1. Make this Size 1 tetrahedron.
   It is called Size 1 because each edge is one [1] unit.
2. Make one face of a Size 2 tetrahedron like the one in the picture. Each edge is two units long.
   Add three [3] more faces to make a Size 2 tetrahedron.



3. Make one face of a Size 3 tetrahedron.
   Draw it on the recording sheet.
4. Copy this table into your journal and use the recording sheet to help you fill in the gaps.

Size of Tetrahedron	1	2	3	4	5	10	100
Total number of triangles to make the tetrahedron	4	16					

Challenge

If I tell you any size of tetrahedron can you tell me the number of triangles needed to build it?

AREA OF A TRIANGLE

You Need

- Three [3] sets of four [4] wooden pieces in three [3] colours
- 1cm and 2cm grids printed on plastic

Your Task

1. The four pieces of each colour make a triangle.

   Make the three triangles.

2. Prepare a table like this in your journal.

	RED triangle	BLUE triangle	YELLOW triangle
Base Length			
Height			
Area			

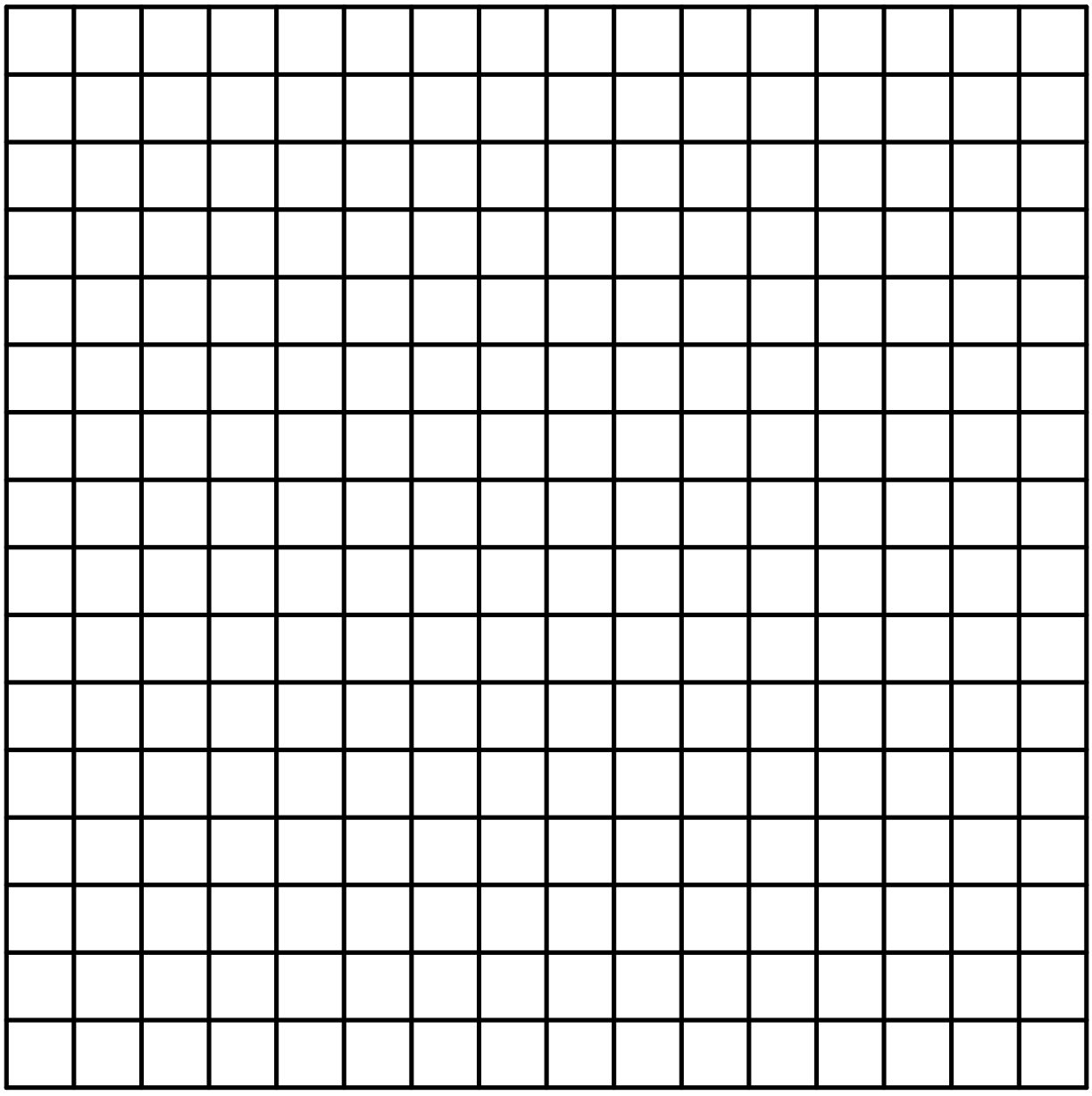
3. Use the 1cm grid to measure the base length and height of each triangle.
4. Rearrange each triangle into a rectangle and use the grid to find each area.

Challenge

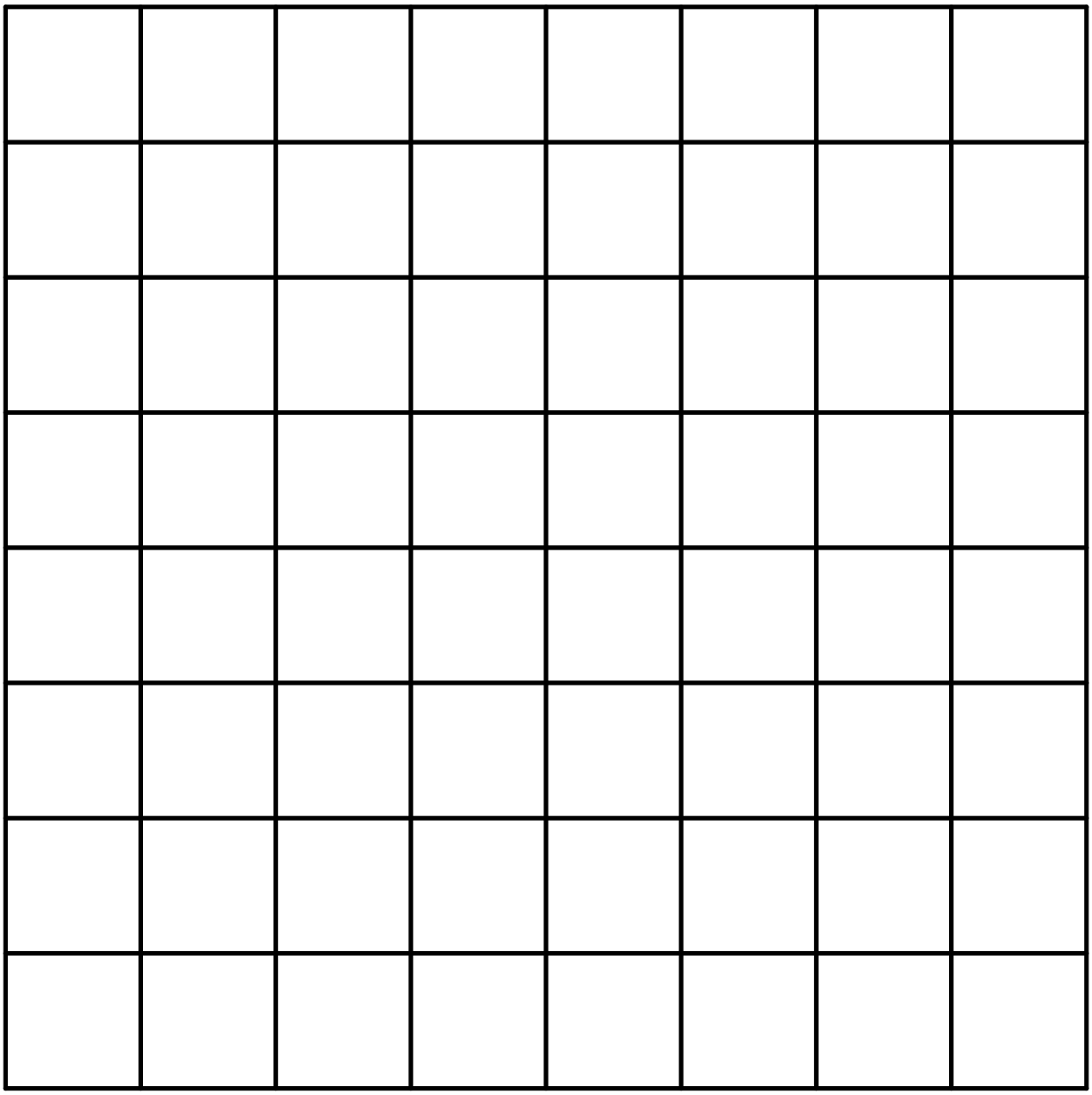
Explain how to use the base length and height of a triangle to calculate its area.

Check that your idea works using the 2cm grid.

Area of a Triangle - 1cm Grid



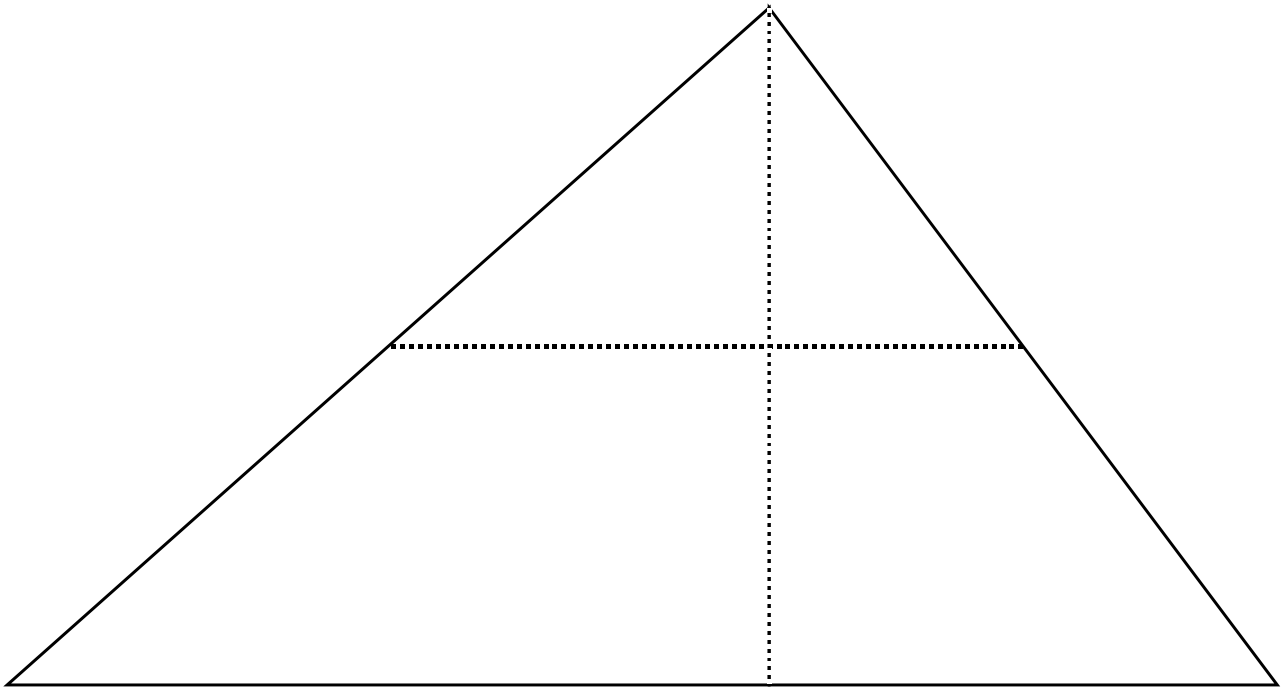
Area of a Triangle - 2cm Grid



Task 187 Triangles

The task needs three different triangles in three different colours.

Each triangle is cut as shown.



The vertical line is perpendicular to the base.

The horizontal is the perpendicular bisector of the vertical line.

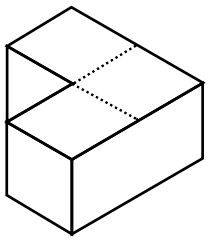
Make the triangles as different as possible in shape and size.

The cuts should be as accurate as possible.

SURFACE AREA WITH TRICUBES

You Need

- Four [4] tricube pieces

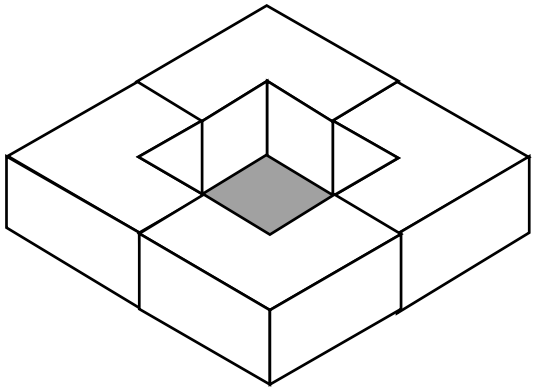


One [1] tricube sitting this way on the table has:

- a volume of three [3] cubes
- a surface area of fourteen [14] squares
- a base area of three squares
  (the area that 'sits on the table').

Your Task

1. Make this 'doughnut' shape. Its Volume is 12 cubes. Calculate its Base Area and Surface Area.



2. Make several objects with all four tricubes. For each one calculate the surface area (SA) and base area (BA).

Challenge

Create objects with these [SA, BA] pairs.
(Yes the last four **can** be made.)

a) [32, 6] b) [32, 4] c) [38, 8] d) [40, 4] e) [50, 2]

f) [50, 1] g) [44, 0] h) [38, 0] i) [36, 0] j) [52, 0]

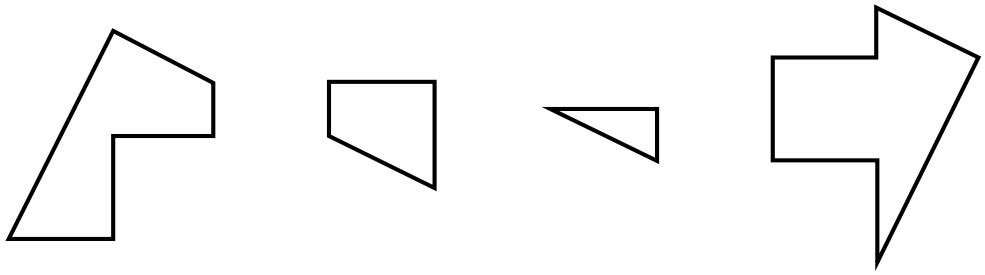
CROSS & SQUARE

You Need

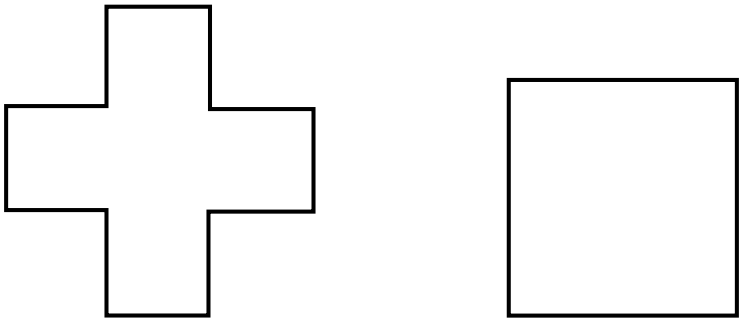
- Four [4] pieces as shown in the first picture and a recording sheet

Your Task

1. Use these pieces...



to make...

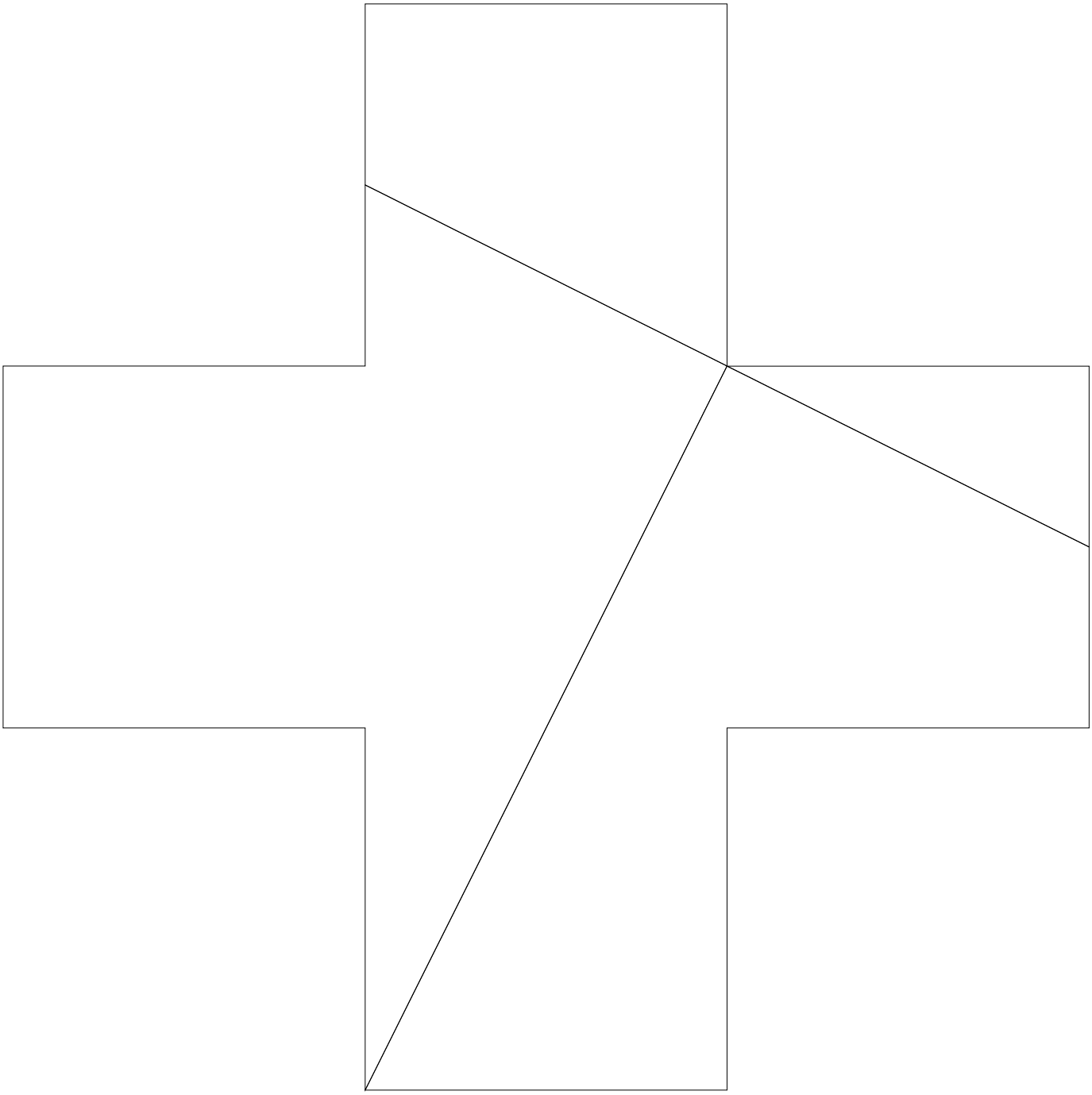


a Cross and then a Square.

2. Trace the Cross and the Square onto the recording sheet and count squares to work out the area of each shape.

Challenge

The Cross and the Square are made from the same pieces so they should have the same area. Do they? Can you explain?



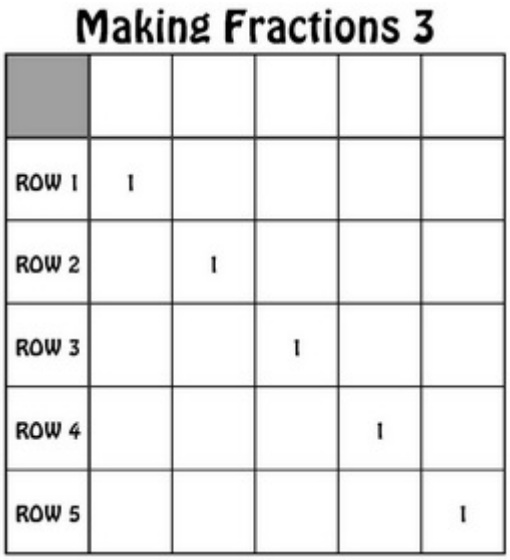
The cross is made equivalent to 5 squares each made of 16 unit squares of 1.5cm. It clearly has an area of 80 unit squares (5 x 16).
The four pieces that result from the dissection can be rearranged in two ways to form a square that APPEARS to be 9x9 (ie: 81 unit squares) when placed on a grid of 1.5cm squares.
It is important that all pieces are as accurate as possible so the saw cuts don't distract from the square appearing to fit into the 9x9. Measurements in picture above are accurate.
All lengths of all arms of the cross are 6cm.Edges of arms must be parallel AND in line, ie: at the same 'latitude'.

MAKING FRACTIONS 3

You Need

- One [1] set of twenty-seven [27] blocks - two [2] of the largest size, three [3] of the next largest, four [4] of the middle size, six [6] of the second smallest size and twelve [12] of the smallest size
- Board shown in the picture, marker and wiping cloth

Your Task



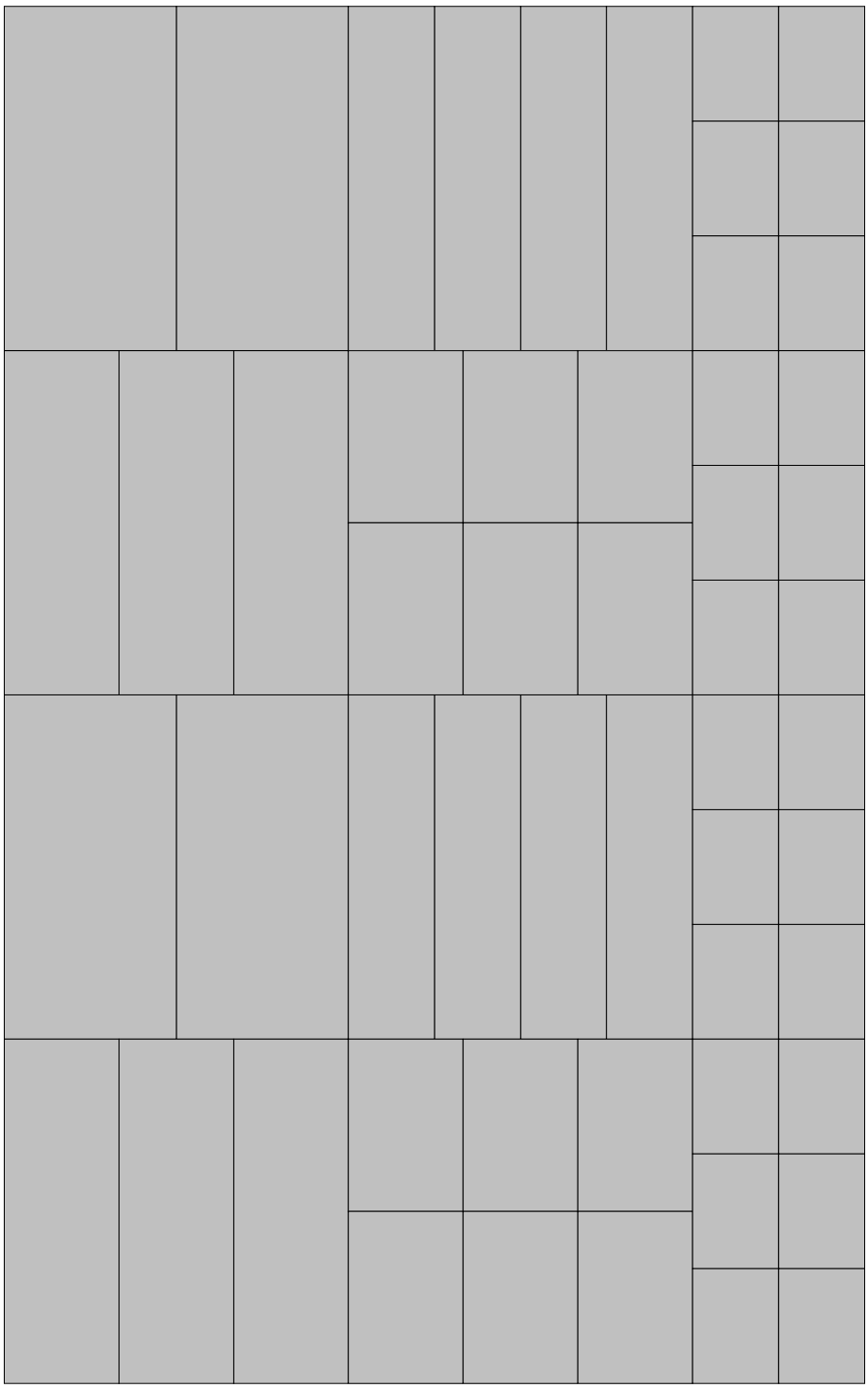
1. Arrange one block of each size in order from biggest to smallest.
2. Sketch a picture of each shape in order along the top row of the board.
3. In Row 1 the biggest piece is worth 1.
   Write the value of each of the other pieces along Row 1.
4. In Row 2 the second biggest piece is worth 1.
   Write the value of each of the other pieces along Row 2.
5. Continue filling in Rows 3 to 5 the same way.
6. Copy the table into your journal and write about any patterns you see.

Challenge

Start the task over again, but this time the chosen piece in each row costs $1 to make. Work out the cost of making each of the other pieces in that row. Record in your journal.

Making Fractions 3

ROW 1	1				
ROW 2		1			
ROW 3			1		
ROW 4				1	
ROW 5					1



Task 199, Making Fractions 3 Print on thick card or make from plywood. This master produces 2 sets.

MAKE THE WHOLE

You Need

- One [1] set of coloured rods:
  20 white, 10 red, 9 light green, 8 pink, 7 yellow,
  6 dark green, 5 black, 4 brown, 3 blue, 2 orange
- One [1] set of cards for an *Orange Is Whole* game

In this game you have to be first to EXACTLY make the whole from its fraction parts.

To Begin

- Place the card that states the whole where it can be seen.
- Each player takes a whole rod and places it in front of them.
- Shuffle the cards and place them face down.
- Players take turns to choose the top card and keep it as their SECRET card.

Rules

1. Take turns to choose the top card and do ONE of these things:
   a) Add to your rod collection the rod shown by the fraction on the card.
   b) Take away from your rod collection the rod shown by the fraction on the card.
   c) Change the pick up card into your secret card and do ONE of:
   (a) or (b) with the old secret card.
   d) Pass and place the pick up card on the discard pile.
2. Play continues like this until one player makes the whole and wins.
3. If the cards run out, shuffle the discards and use them again.
4. Record the winning collection with words, or as a picture, or in symbols.
   Example: *Rita made the whole with one half plus one tenth plus two fifths*.

Make The Whole Cards

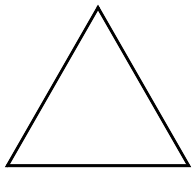
MAKE THE WHOLE CARDS	ORANGE ROD IS WHOLE	ONE HALF ($1/2$)
ONE HALF ($1/2$)	ONE FIFTH ($1/5$)	ONE FIFTH ($1/5$)
ONE FIFTH ($1/5$)	ONE FIFTH ($1/5$)	ONE FIFTH ($1/5$)
ONE TENTH ($1/10$)	ONE TENTH ($1/10$)	ONE TENTH ($1/10$)
ONE TENTH ($1/10$)	ONE TENTH ($1/10$)	ONE TENTH ($1/10$)
ONE TENTH ($1/10$)	ONE TENTH ($1/10$)	ONE TENTH ($1/10$)
ONE TENTH ($1/10$)		

Cut this sheet into separate cards to prepare this task.

TRIANGLE PERIMETERS

You Need

- Sixteen [16] triangle tiles



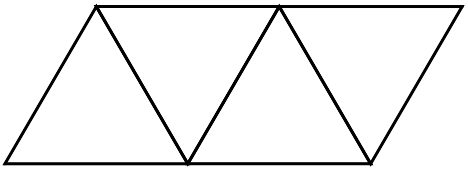
Perimeter is the distance around the outside of a shape.

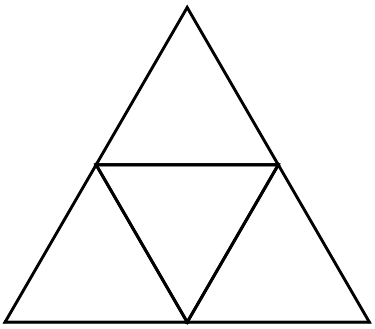
The perimeter of this triangle can be measured by counting side lengths.

It has a perimeter of three [3] side lengths.

Your Task

1. Make these four triangle shapes.
   Triangles must touch along the full length of a side.
   What is the perimeter of each shape?
2. Make shapes with five [5] triangle tiles. Investigate their perimeters.
3. Make shapes with six [6] triangle tiles. Investigate their perimeters.





Challenge

Make shapes with sixteen triangle tiles.

Which shape has the longest perimeter?

Which shape has the shortest?

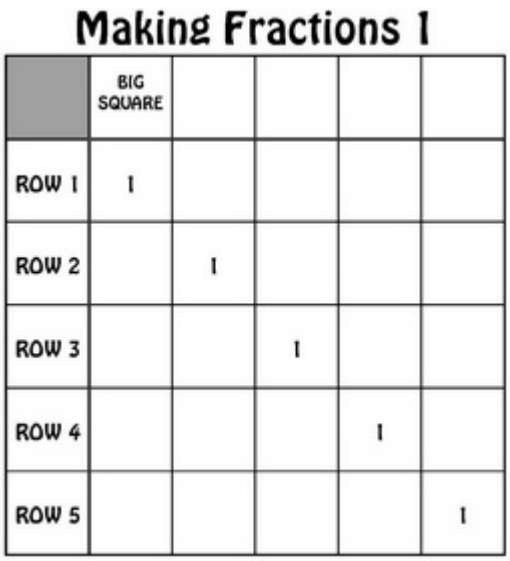
- Can you find shapes for all the perimeters between the longest and the shortest?

MAKING FRACTIONS 1

You Need

- Five [5] sizes of blocks - one [1] big square and enough of each of the other shapes to cover the big square
- Board shown in the picture, marker and wiping cloth

Your Task



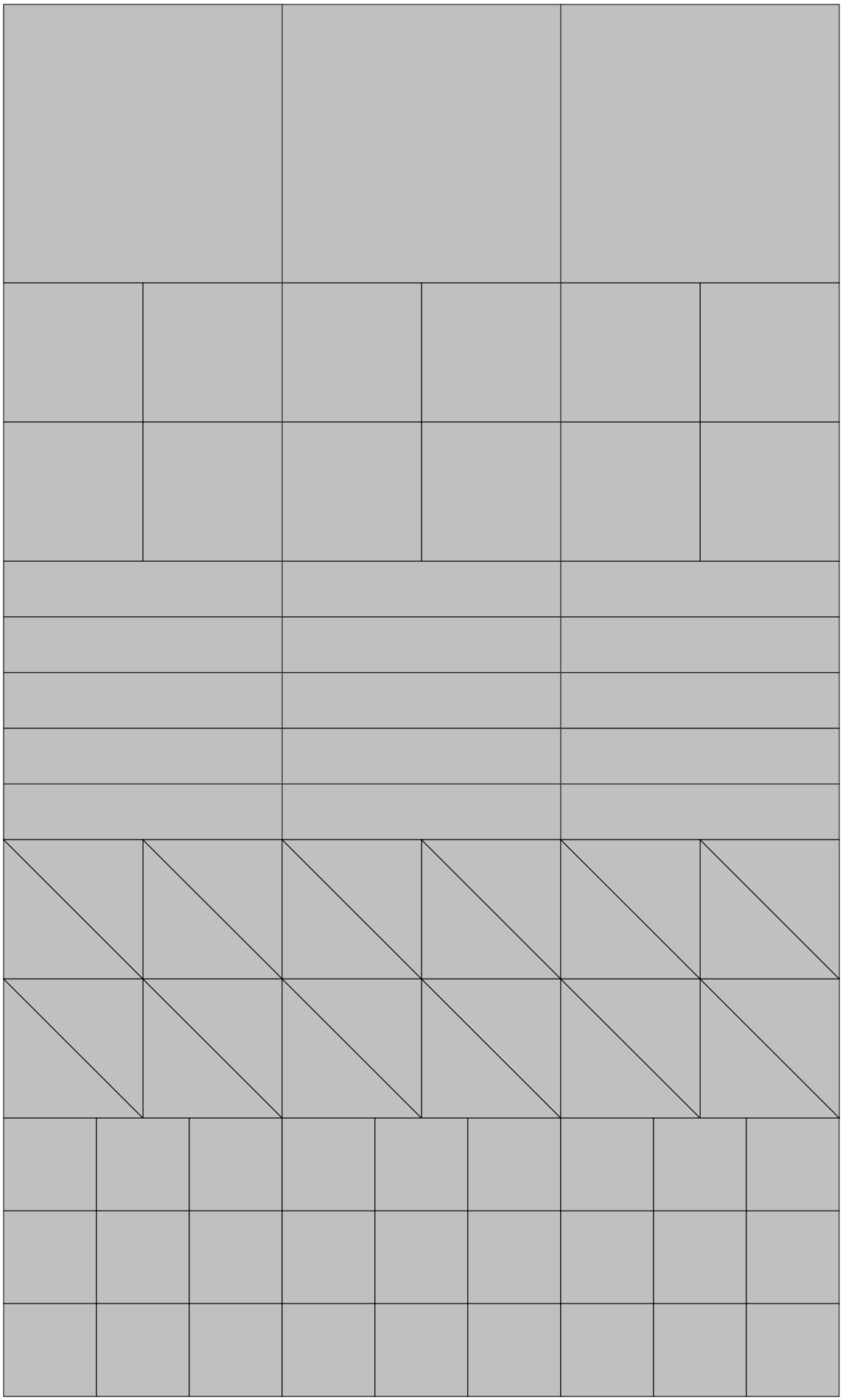
1. Arrange one block of each size in order from biggest to smallest.
2. Sketch a picture of each shape in order along the top row of the board.
3. In Row 1 the biggest piece is worth 1.
   Write the value of each of the other pieces along Row 1.
4. In Row 2 the second biggest piece is worth 1.
   Write the value of each of the other pieces along Row 2.
5. Continue filling in Rows 3 to 5 the same way.
6. Copy the table into your journal and write about any patterns you see.

Challenge

Start the task over again, but this time the chosen piece in each row costs $1 to make. Work out the cost of making each of the other pieces in that row. Record in your journal.

Making Fractions 1

	BIG SQUARE				
ROW 1	1				
ROW 2		1			
ROW 3			1		
ROW 4				1	
ROW 5					1



Task 222, Making Fractions 1 Print on thick card or make from plywood. This master produces 3 sets.

PLAYING WITH OBJECTS

You Need

- Seven [7] objects and twenty [20] name cards
  (You may not need all the cards.)
- One [1] container of rice

Some cards are names that students use for objects.

Some cards are names that mathematicians use for objects.

Your Task

1. You will have these objects:

Box	Long Box
Pyramid	Dog Kennel
Can	and two [2] other objects

   One of the others will have a student name card. One might not have.

   Match up as many objects and student name cards as possible.

   Invent a name for your extra object.

2. You will have these objects:

Cylinder	Cuboid
Cube	and a triangular prism

   Match up as many objects and mathematician name cards as possible.

   Find out the mathematician names for your other objects.

Challenge

Use the rice to investigate relationships between the objects.

Record your work in your journal.

BOX	LONG BOX	CAN	DOG DISH
PYRAMID	FIVE SIDER	ICE-CREAM CONE	SIX SIDER
DOG KENNEL	EIGHT SIDER	HEXAGONAL PRISM	CUBOID
SQUARE PYRAMID	TRAPEZOIDAL PRISM	HEMISPHERE	CUBE
CYLINDER	OCTAGONAL PRISM	CONE	PENTAGONAL PRISM
BOX	LONG BOX	CAN	DOG DISH
PYRAMID	FIVE SIDER	ICE-CREAM CONE	SIX SIDER
DOG KENNEL	EIGHT SIDER	HEXAGONAL PRISM	CUBOID
SQUARE PYRAMID	TRAPEZOIDAL PRISM	HEMISPHERE	CUBE
CYLINDER	OCTAGONAL PRISM	CONE	PENTAGONAL PRISM

VOLUME LINE UP

You Need

- Seven [7] containers in a range of shapes
- One [1] container of rice
- One [1] measuring cup marked in millilitres

Volume is the space inside an object. In this task you measure that space with rice. Sometimes the measurement of that space is called the capacity of the object.

Your Task

1. Which container holds the most rice?
   Which container holds the least rice?
   How do you know? Write or draw to explain your answer.
2. Line up the containers in the way you guess is the order of their volume.
   Try to find all the clues you can from the shapes. Take the time to talk about where each one belongs in the line.
3. Use the rice to check your guess. Make notes as you work.

Challenge

Suppose you checked your results using the millilitre measuring container.
Explain whether the order from biggest to smallest might change.
Estimate, measure and then record the capacity of each container.
Write a report of your investigation.

KOALA KARTS

You Need

- One [1] cart and twelve [12] koalas - three [3] sizes in four [4] colours
- Four [4] road cards and fourteen [14] small 'road sign' cards

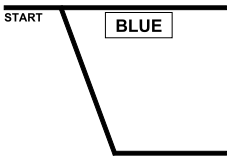
In this game you make koalas go different directions using 'road signs'.

Rules

- Make a road. Place one small card at each *forward fork*.
- Use the cart to take *one koala at a time* along the road.
- Carts *only go forward* on the road.
- Leave the koala at the end of the road. Start again with a new koala.

1. Make this road. The small card tells you the only koalas that go this way.

   What sort of koalas collect on the *top road*?



2. Shift BLUE to the other fork. What sort of koalas collect on the *top road* now?
3. Make this road. What sort of koalas collect on the *top road*?

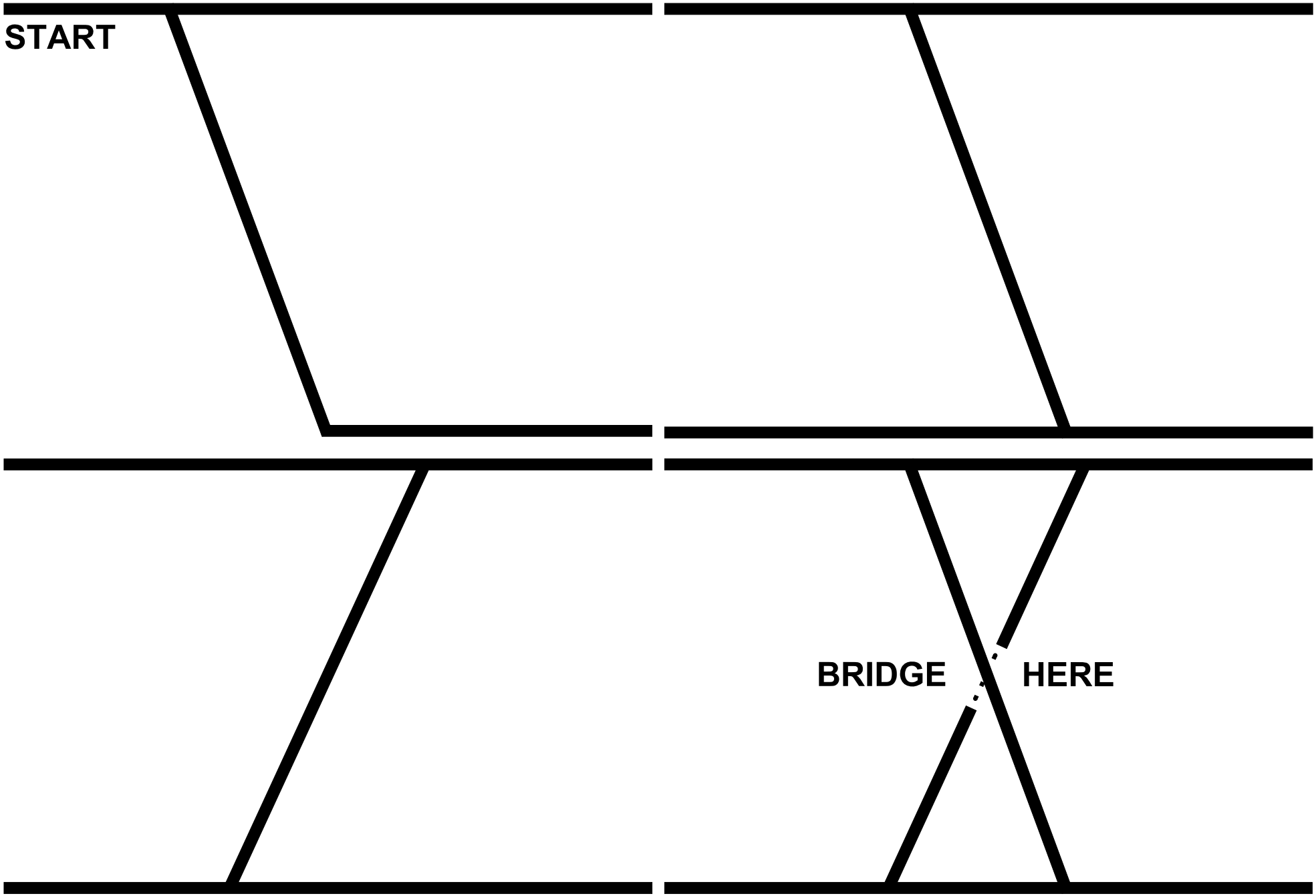
Challenge

Create your own roads and play the game so that:

- only large and yellow koalas collect on the top road.
- only red or medium koalas collect on the top road.
- only not green koalas and not small koalas collect on the top road.

Create your own roads and play the game.

Guess what koalas collect on the top road, then check.


START
BRIDGE
HERE

RED	BLUE	GREEN	YELLOW	SMALL	MEDIUM	LARGE
NOT RED	NOT BLUE	NOT GREEN	NOT YELLOW	NOT SMALL	NOT MEDIUM	NOT LARGE
RED	BLUE	GREEN	YELLOW	SMALL	MEDIUM	LARGE
NOT RED	NOT BLUE	NOT GREEN	NOT YELLOW	NOT SMALL	NOT MEDIUM	NOT LARGE
RED	BLUE	GREEN	YELLOW	SMALL	MEDIUM	LARGE
NOT RED	NOT BLUE	NOT GREEN	NOT YELLOW	NOT SMALL	NOT MEDIUM	NOT LARGE
RED	BLUE	GREEN	YELLOW	SMALL	MEDIUM	LARGE
NOT RED	NOT BLUE	NOT GREEN	NOT YELLOW	NOT SMALL	NOT MEDIUM	NOT LARGE
RED	BLUE	GREEN	YELLOW	SMALL	MEDIUM	LARGE
NOT RED	NOT BLUE	NOT GREEN	NOT YELLOW	NOT SMALL	NOT MEDIUM	NOT LARGE
RED	BLUE	GREEN	YELLOW	SMALL	MEDIUM	LARGE
NOT RED	NOT BLUE	NOT GREEN	NOT YELLOW	NOT SMALL	NOT MEDIUM	NOT LARGE

PACK UP YOUR BEARS

You Need

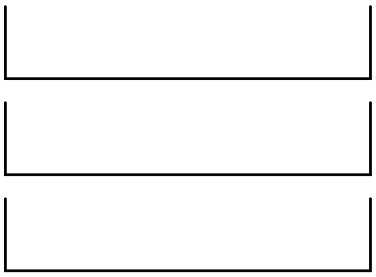
- Ten [10] bears, all the same colour, and one [1] board of trays

The Story

Ulla and Sanya are playing with six [6] bears. Ulla says it is time to pack up.

There are three [3] trays for the bears.

Six bears is the most in one tray.

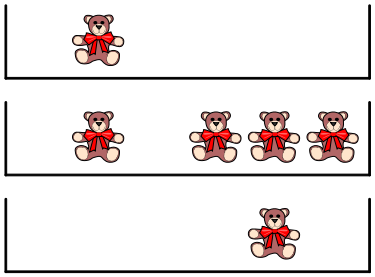


Your Task

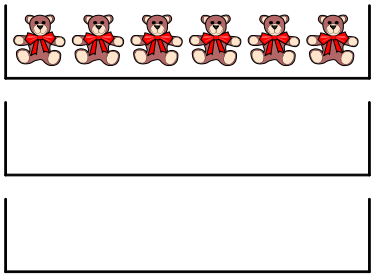
1. Pack your bears in the trays.

   Use numbers to record how you pack them.

   Examples:



1 + 4 + 1



6 + 0 + 0

2. Find five [5] different ways to pack the bears.

Challenge

How many different ways can you find to pack the bears?

What happens if you have three trays and change the number of bears?

What happens if you have four [4] trays and six bears?

Pack Up Your Bears

Put the bears in the trays.
Six [6] bears is the most that can fit in each tray.

MONEY MONEY MONEY

You Need

- Forty-two [42] bank notes
  ...10 x $100, 10 x $50 , 10 x $20 , 10 x $5, 2 x $10
- Playing board with four [4] 'wallets'

The Story

The teller at the Second Mathematical Bank daydreams about money problems. You have to help her solve them.

Your Task

1. The teller gives out 1 x $100, 3 x $50, 7 x $20, 2 x $10 and 7 x $5
   - A gets $90 ... B gets $100 ... C gets $135 ... D gets $120
   - Each person gets exactly five [5] notes.

   Which notes does each person get?
2. The teller gives out money so that:
   - B has double A ... C has double B ... D has $30 less than B.
   - A has 2 notes ... B has 3 notes ... C has 4 notes ... D has 5 notes.
   - The four people have $870 in total.

   How much money does each person have and what notes is it made from?

Challenge

- A has less than $100.
- B has twice A.
- C's amount is half way between A and B.
- D has $20 more than C, but $15 less than B.
- A and C have two notes each B and D have three notes each.

How much money does each person have and what notes is it made from?

MONEY MONEY MONEY

Person A	Person B	Person C	Person D

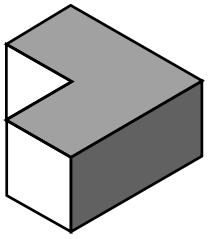
GROWING TRICUBES

You Need

- Sixteen [16] tricubes and a recording sheet

Tricubes are made from three [3] cubes.

This is a Size 1 tricube.



Your Task

1. Placed on the table like this, what is its:
   - base area?
   - surface area?
   - volume?
2. Place the tricube so it has a base area of two [2].

   Explain what happens to the other measurements.
3. Arrange the tricube so it has a base area of one [1].

   Have the other measurements changed?
4. Arrange the tricube so it has a base area of zero [0].

   Have the other measurements changed?
5. Put two tricubes together in eight [8] different ways.

   Draw the one(s) with the greatest and least surface area.
6. Arrange four [4] tricubes to make a 'tricube'. Draw your answer.
7. Your answer to Question 6 is not really a tricube. Explain why.

Challenge

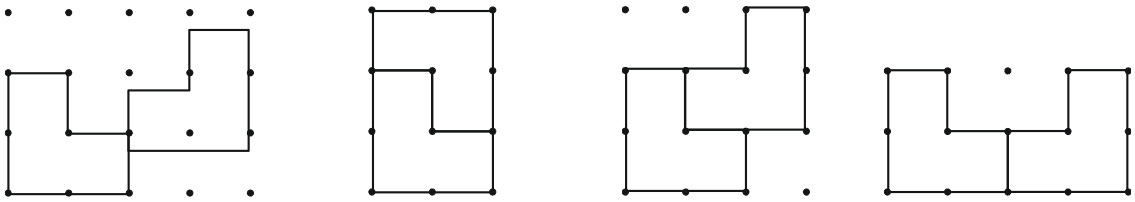
- Make a Size 2 tricube. Draw your answer and record its base area (when placed like Size 1), surface area and volume.
- Use all your tricubes to help you imagine the next size tricube.
- Record its base area (when placed like Size 1), surface area & volume.
- What measurements do you predict for the next size? ... and the next?

TRISQUARES

You Need

- Eight [8] Trisquares and a recording sheet

A Trisquare is made from three [3] squares.
Trisquares are joined *at their edges* to make new shapes.



NOT OK OK OK OK

Your Task

1. Use two [2] Trisquares to make and draw at least five [5] new shapes.
2. How many 2-Trisquare shapes are there?
   How do you know when you have found them all?
   (Hint: Fix one Trisquare. Move the other one around it.)
3. All 2-Trisquares have the same area - six [6] squares.
   Calculate and record the perimeter of each of your 2-Trisquare drawings.
4. Find the 2-Trisquare shape with the shortest perimeter.
5. Find the 2-Trisquare shape with the longest perimeter.
6. Make some 4-Trisquare shapes and draw five [5] that interest you.

Challenge

Find the 4-Trisquare shape with the shortest perimeter.

Find the 4-Trisquare shape with the longest perimeter.

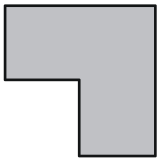
GROWING TRISQUARES

You Need

- Sixteen [16] Trisquares and your own graph paper

Your Task

This is a Size 1 Triquare.



It is made from three [3] squares.

1. Use four [4] Trisquares to make a larger Trisquare. This will be Size 2. Draw it and show how the pieces fit.
2. Make Size 4. Draw it and show how the pieces fit.
3. How many Size 1 pieces does it take to make a Size 8? Can you check your answer another way?
4. How many Size 1 pieces do you need to make:
   a) Size 16? b) Size 32?
5. You have 262,144 Size 1 pieces.
   What is the largest Trisquare you can build with them?

Challenge

Jenny showed she could make a Size 3 Trisquare with nine [9] pieces. How did she do it?

MONEY CHARTS

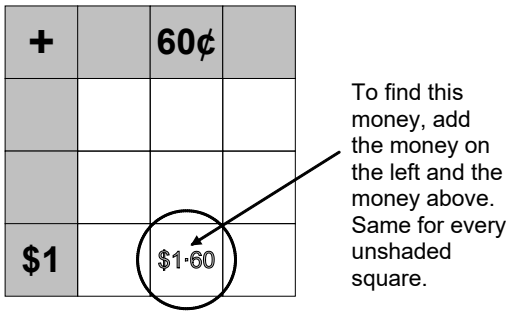
You Need

- Play money:
  10x5¢, 10x10¢, 20x20¢, 10x50¢, 10x$1, 5x$2
- Two [2] boards: Money Charts A & Money Charts B

Your Task

Money Charts works like this:

1. Use Chart A:
   a) Place coins correctly on the pictures.
   b) Calculate the money for each empty square.
   c) Show answers with the smallest number of coins.



2. Use Chart B:
   a) Place coins correctly on the money squares.
   b) Calculate the money for each empty square.
   c) Show answers with the smallest number of coins.

Money Charts A

+			
			
			
			

You are correct if you have 4 x 5¢, 5 x 10¢, 11 x 20¢, 9 x 50¢, 2 x $1, 4 x $2 on the board.

Money Charts B

+				
		$1·10		$1·05
			$1·00	$1·10
	$2·20		90¢	
50¢		95¢		

You are correct if you have 8 x 5¢, 10 x 10¢, 18 x 20¢, 10 x 50¢, 8 x $1, 4 x $2 on the board.