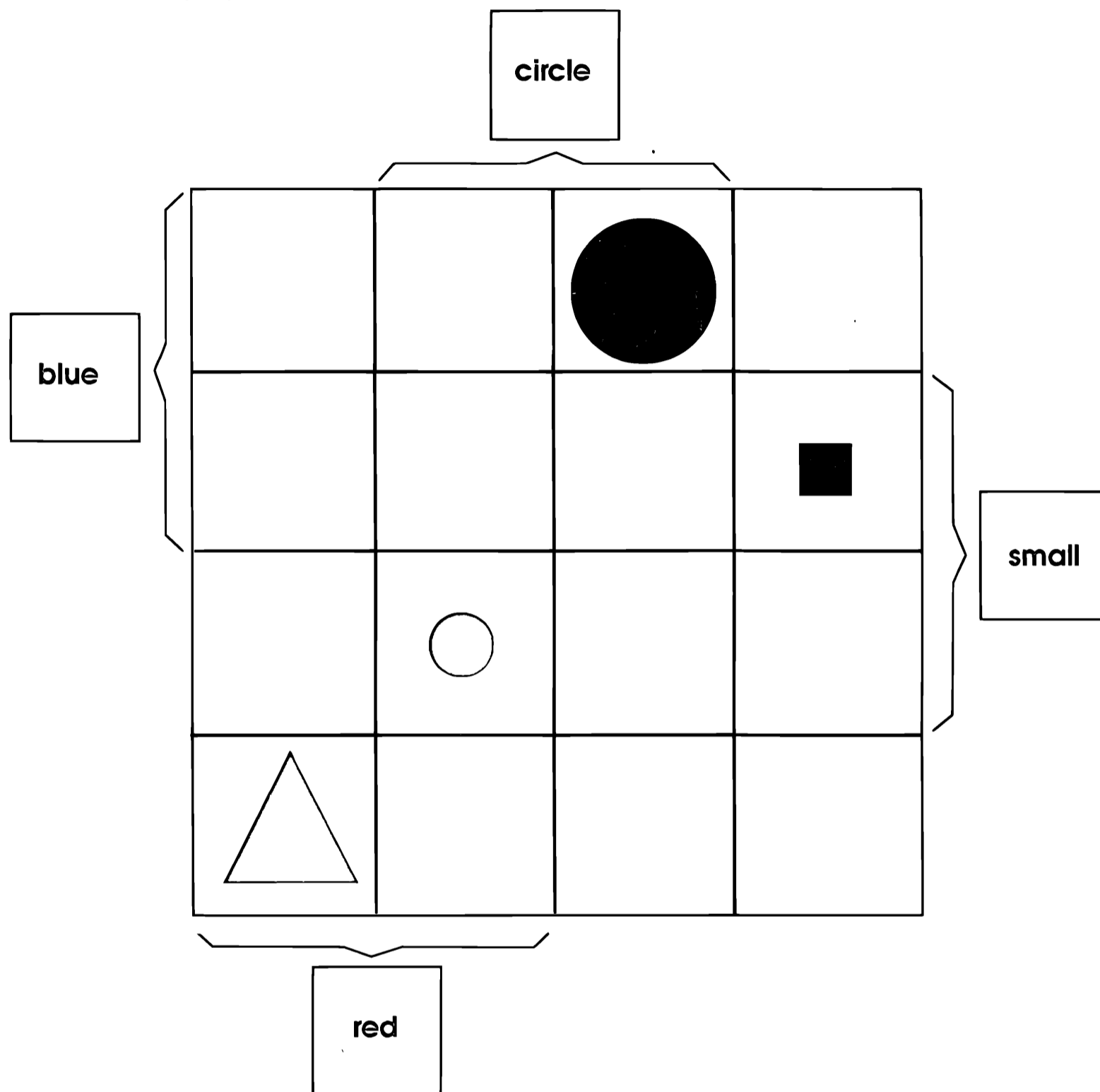


# Logic Maps

You will need: logiblocks, attribute logicards from Smile cut-out sheet 0579a.

An activity for 2 people.



1. Draw a logic map (a large 4 x 4 grid).  
Label the logic map with 4 attribute logicards.

The attributes blue red small circle are used here.

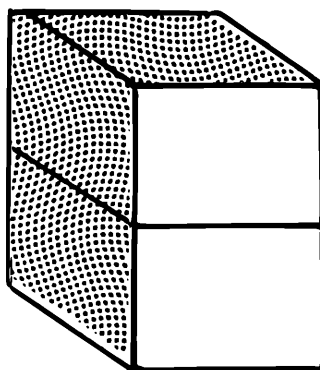
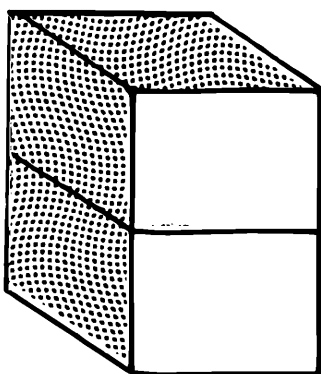
2. Pick up a logiblock. Describe the shape and then place in the correct place on the logic map (the attribute cards will help you).
3. Take turns to place logiblocks on the logic map.
4. Fill all the possible spaces.
5. Try the activity using different attributes.  
Each time record your results.

You will need: Centi-cubes

---

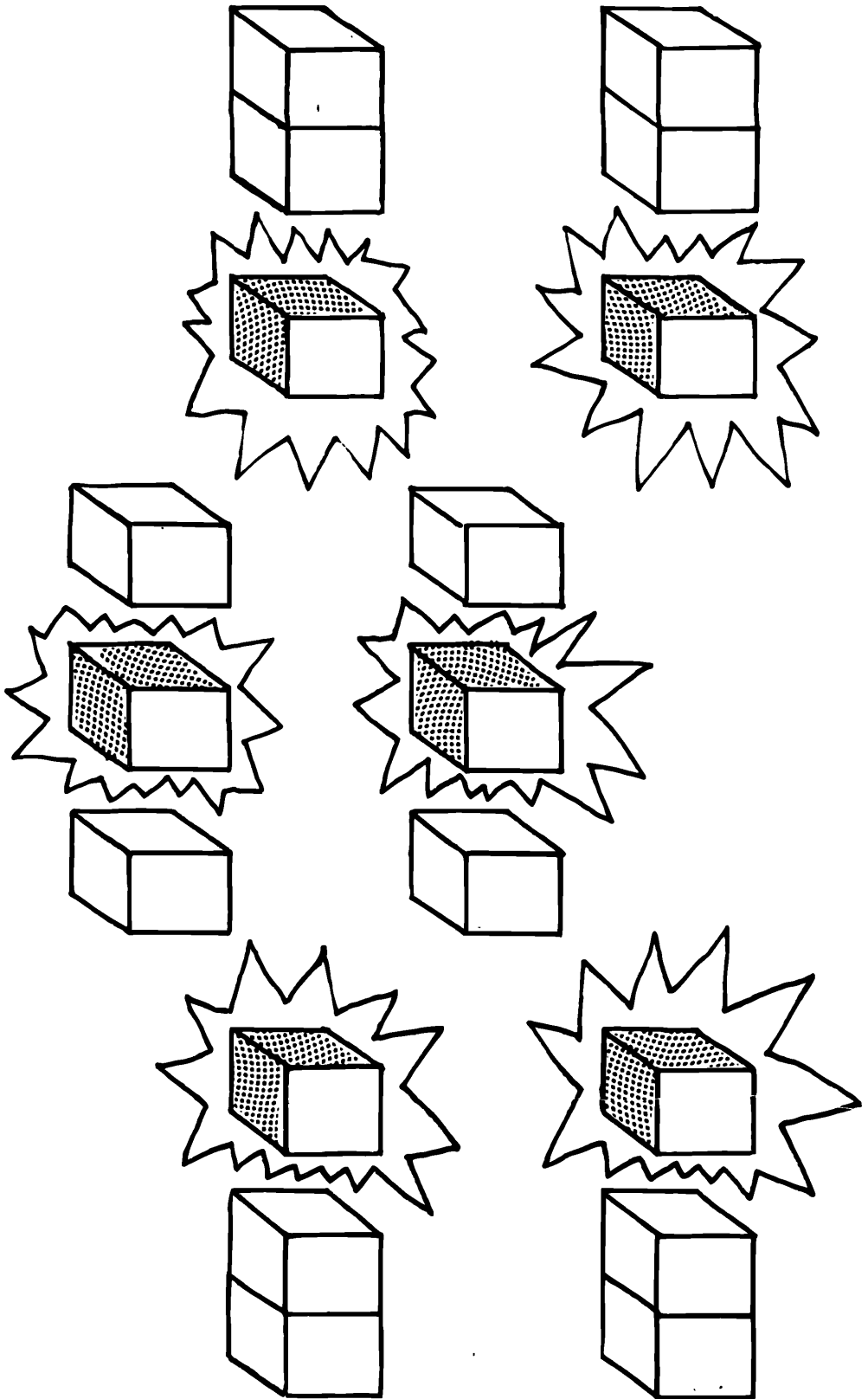
# Forty Towers

Make both these 2 - towers using yellow and red centi-cubes.

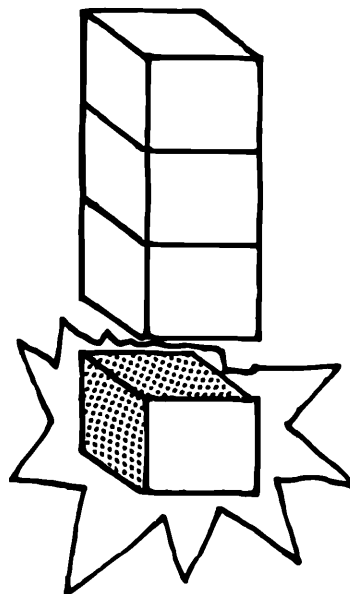


Use these 2 - towers and some blue centi-cubes to make as many different 3 - towers as you can.

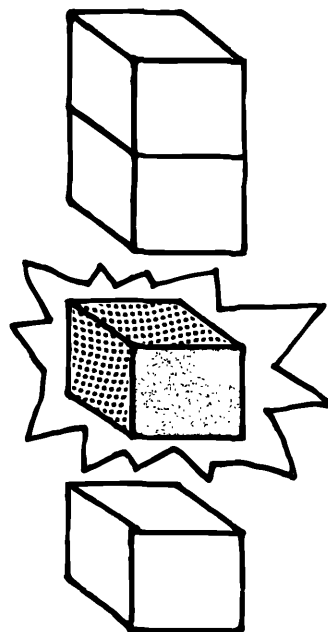
Did you get all these?



How many 4 - towers can you make,  
which have green at the bottom?



How many 4 - towers are  
there with green second  
from the bottom?



How many 4 - towers are there  
altogether?

Copy and complete this table in your own book.

Number of Colours	Number of different towers	
1	1	1
2	2	$2 \times 1$
3	6	$3 \times 2 \times 1$
4		
10		
40		
n		

# RANDOM CODE

Smile 0689

This table shows part of a random code:

a	b	c	d	e	f	g	h	i	j	k	l	m	n	o	p	q	r	s	t	u	v	w	x	y	z	,	.
5		23	11	15		14		12	28		18			17	21		9	16		22	25			13	3	20	27

Copy and complete the random code using the algebra clues.

### Algebra clues:

$$b + 7 = 15$$

$$\frac{1}{2}n = 13$$

$$f - 5 = 14$$

$$4q = q + 12$$

$$3h = 21$$

$$33w - 12 = 21$$

$$5k + 3 = 53$$

$$x^2 = 36$$

$$4m - 7 = 1$$

$$\frac{t}{8} = 3$$

### Algebra help:

- $3a$  means 3 multiplied by a  
example:  $3a = 15$  so  $a = 5$

- $\frac{g}{2}$  means g divided by 2  
example:  $\frac{g}{2} = 7$  so  $g = 14$

- $r^2$  means r multiplied by r  
example:  $r^2 = 81$  so  $r = 9$

Copy this message and decode it using the random code.

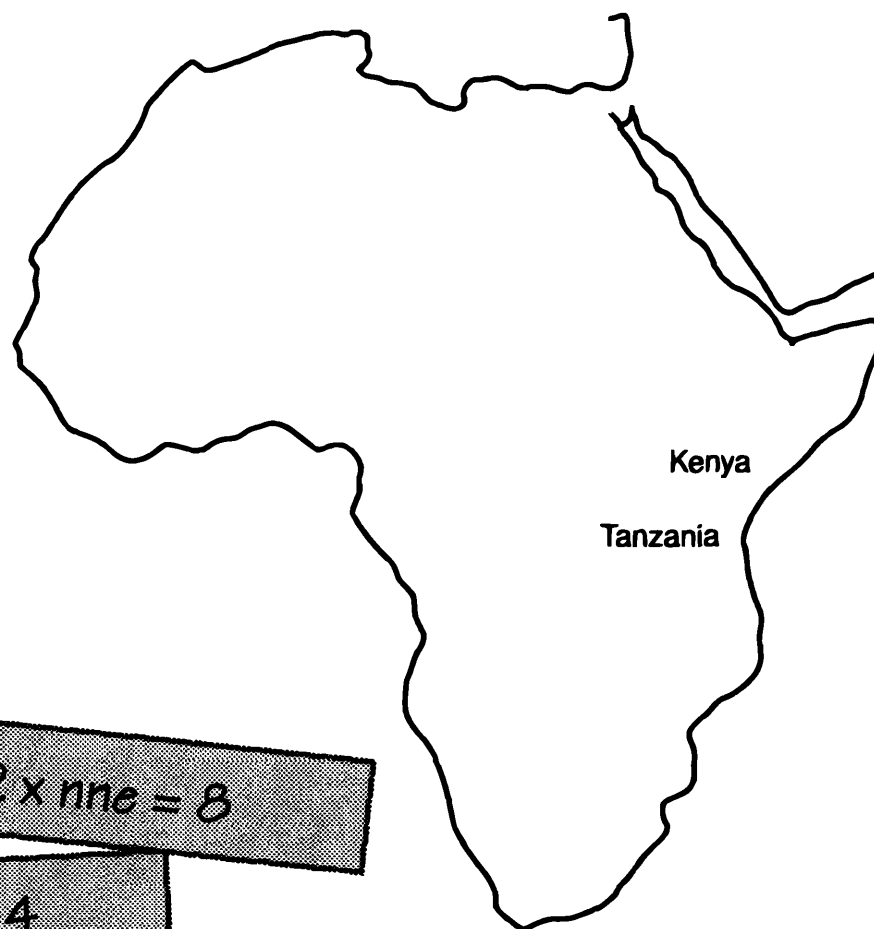
9	5	26	11	17	2		2	15	5	26	16		26	17	24		9	15	14	22	18	5	9		20
---	---	----	----	----	---	--	---	----	---	----	----	--	----	----	----	--	---	----	----	----	----	---	---	--	----

8	13		23	7	5	26	23	15		20		1	12	24	7	17	22	24		17	9	11	15	9		27
---	----	--	----	---	---	----	----	----	--	----	--	---	----	----	---	----	----	----	--	----	---	----	----	---	--	----

# ... and now Swahili

- Swahili is the language spoken by people in East Africa

Work out the Swahili number names from these clues:



$$\text{saba} + 5 = 12$$

$$2 \times \text{nne} = 8$$

$$\text{sita} - 2 = 4$$

$$3 \times \text{mbili} = 6$$

$$\text{kumi} + 5 = 2$$

$$5 \times \text{tatu} + 2 = 17$$

$$3 \times (10 - \text{name}) = 6$$

$$\frac{1}{2} \text{tisa} = 4\frac{1}{2}$$

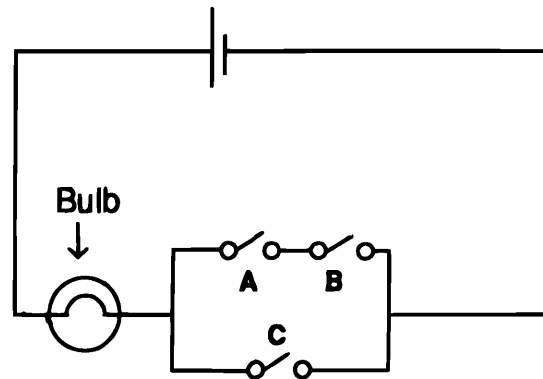
$$1 + \text{moja} = 1$$

$$\text{tano} \times \text{tano} = 25$$

# Which switches?

You may need: wire, bulb, battery and 4 switches.

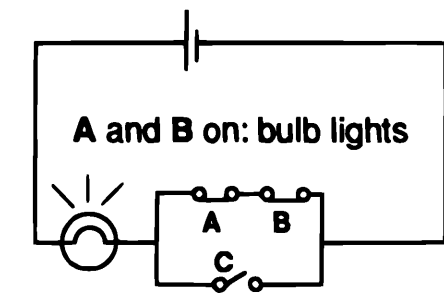
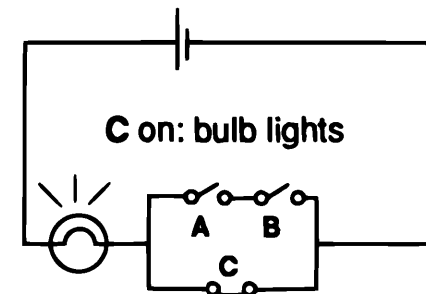
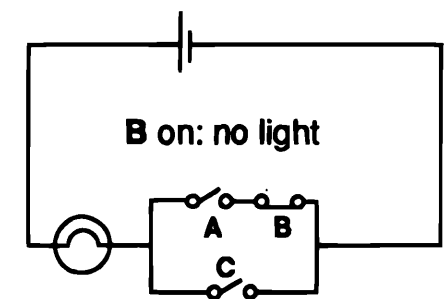
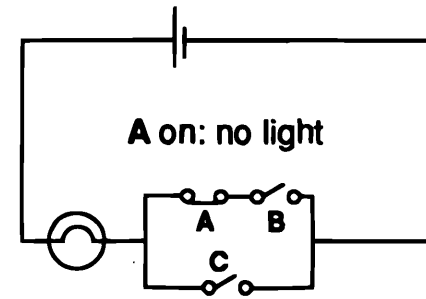
This is a diagram of an electric circuit.



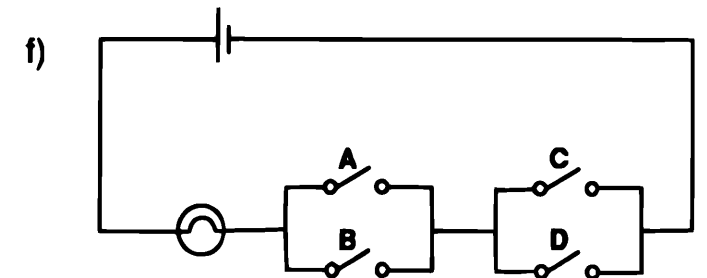
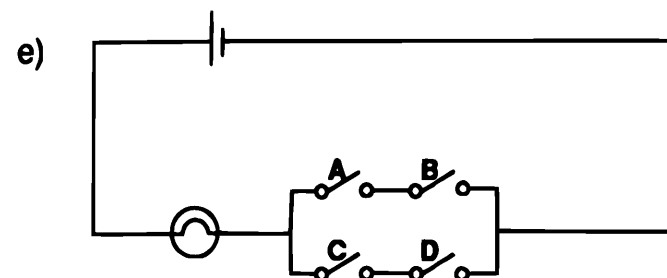
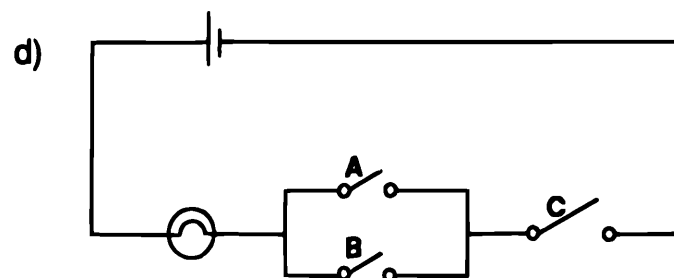
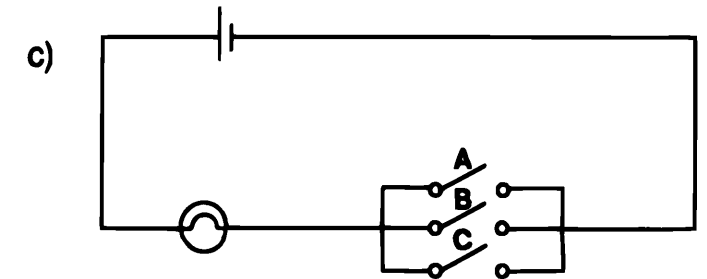
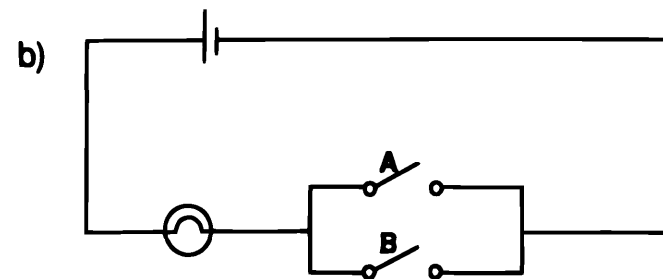
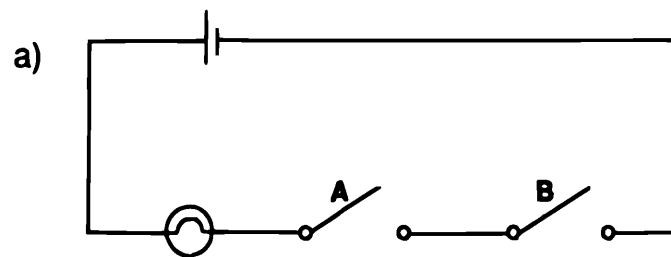
Key	Battery	Bulb	Switch

There must be a **complete circuit** for the bulb to light up.

For the bulb to light in this circuit, *either A and B must both be on or C must be on.*

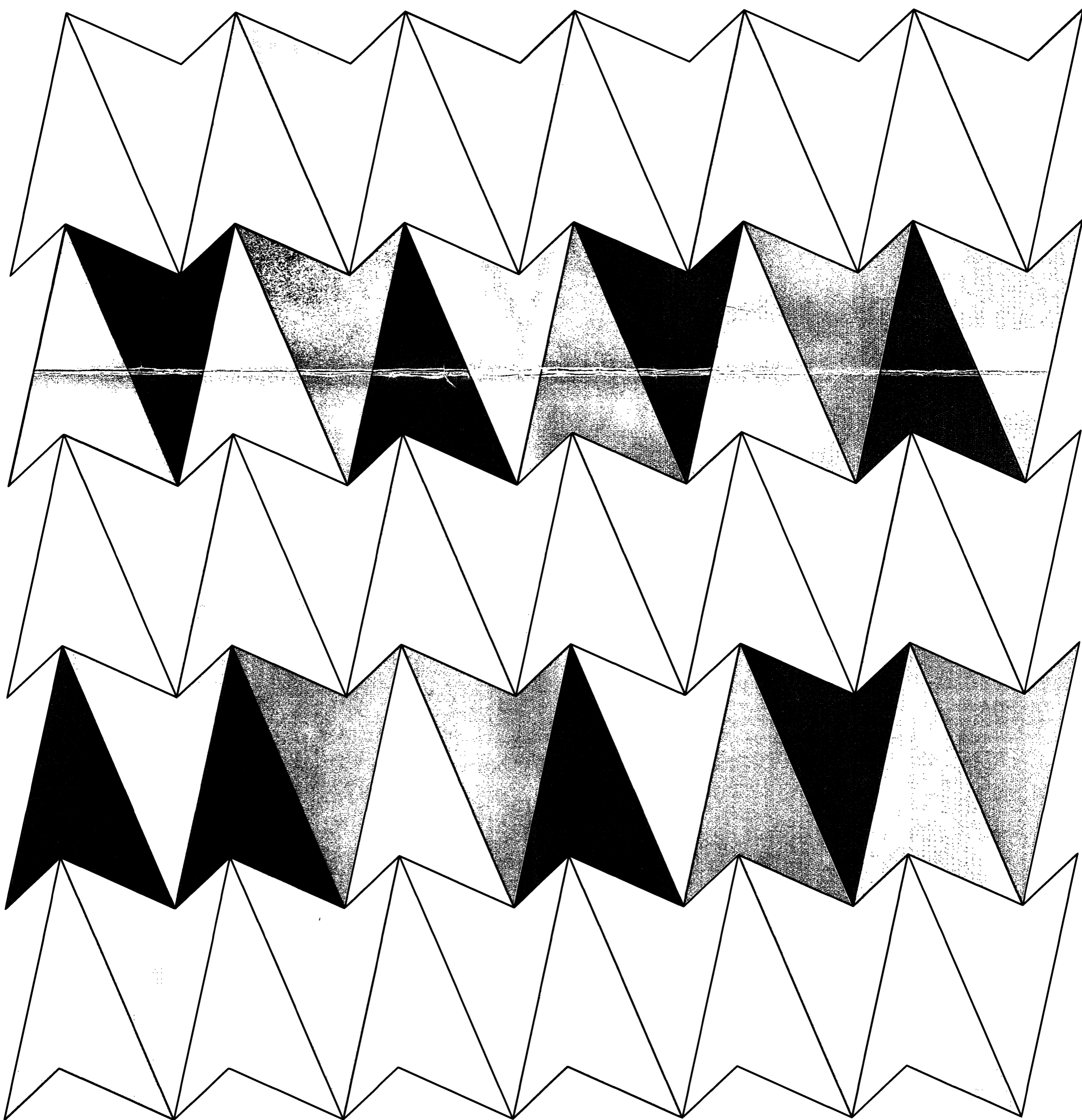


1. Examine these circuits. For each one write down which switches, or combinations of switches, will light the bulb.



2. Make sure someone else can understand your written answers.

# Locate the ERROR



# Number Codex

You will need Smile Worksheet 0696a.

Cut out the *Rotatable Pentagon* from the worksheet.

Place the pentagon on the codex frame so that the letters (a, b, c, . . . z) are mapped to the numbers (1, 2, 3, . . . 25).

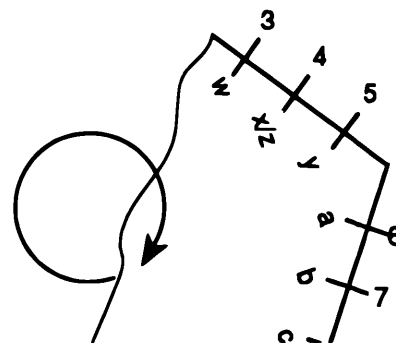
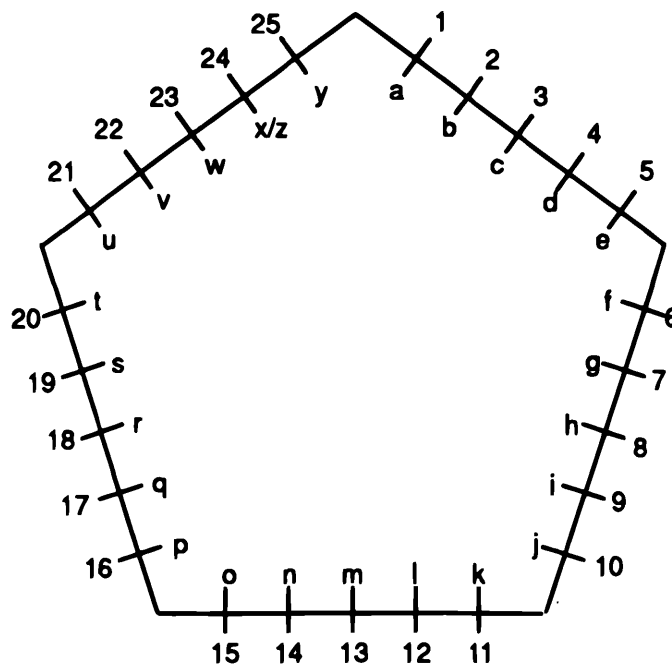
This is **Code one**.

Use this code to decode this sentence.

20,8,9,19 3,15,4,5 9,19 5,1,19,25.

To find **Code two** rotate the pentagon clockwise. . .  
so that the letters (a, b, c, . . . ) are mapped to  
the numbers (6, 7, 8, . . . ).

**Code three, four and five** can be found by continuing  
to rotate the pentagon clockwise.



Decode these four messages. Each uses one of the four new codes. You will need to decide which code to use each time so that the message makes sense.

- a) 5,18,19, 4 23,15, 4, 4, 11, 17, 15 6, 4,15, 4 13, 25,14,15 5,18, 3, 15, 15.
- b) 4 21, 8 9, 10, 18 16, 14 ,4, 9, 2 23, 10, 24, 25 1, 4, 17, 25.
- c) 25, 13, 14, 24 14, 24 8, 20, 9, 10 25, 3, 20.
- d) 16, 4, 19 10, 23, 24, 9 24, 9 18, 5, 19, 20 21, 5, 11, 8.

Turn over.

Using **Code one** the equation  $m + h = u$  is true  
because  $13 + 8 = 21$

Find which code is being used for each of these equations.

- |                      |                           |                           |
|----------------------|---------------------------|---------------------------|
| 1. $j + l = v$       | 2. $s - n = y$            | 3. $kh = w$               |
| 4. $o + z = y$       | 5. $3u = 18$              | 6. $3u = 3$               |
| 7. $\frac{x}{6} = 4$ | 8. $3w = 39$              | 9. $3w = 24$              |
| 10. $12 = 5s - 8$    | 11. $\frac{a}{3} + 1 = 8$ | 12. $\frac{(c+1)}{3} = 8$ |

These equations are each true in two codes. For each one find the two possible codes.

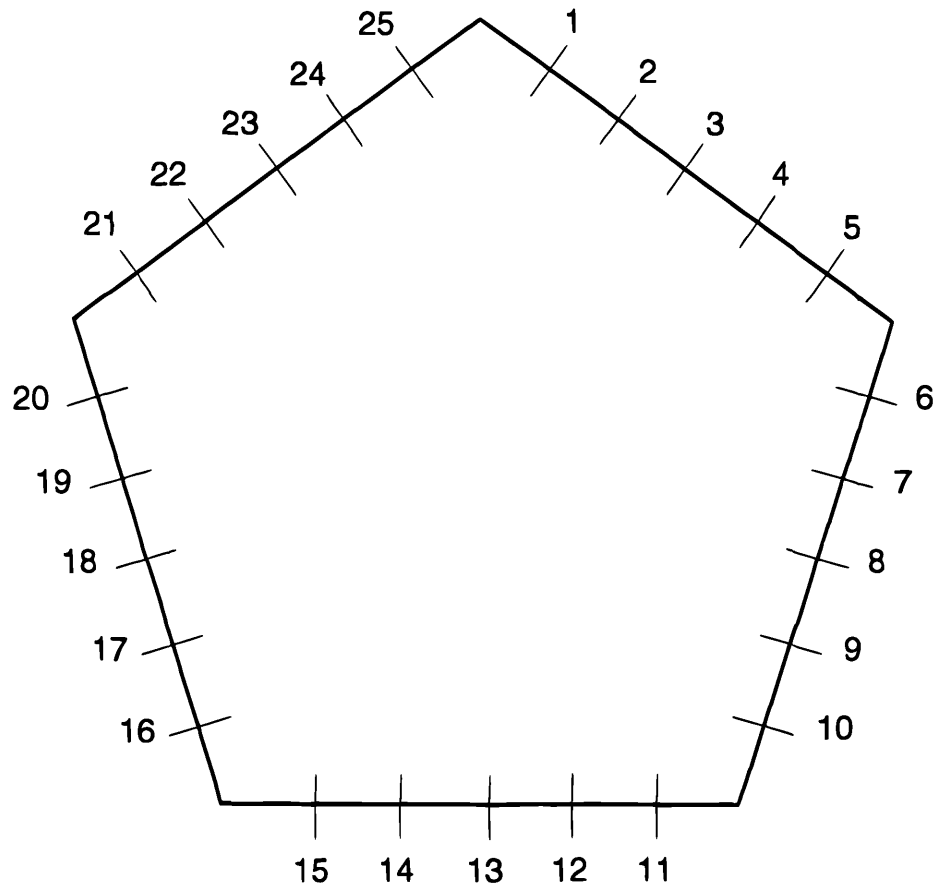
13.  $w - f = 17$                       14.  $f + 15 = u$

15. This equation is true in all the codes.

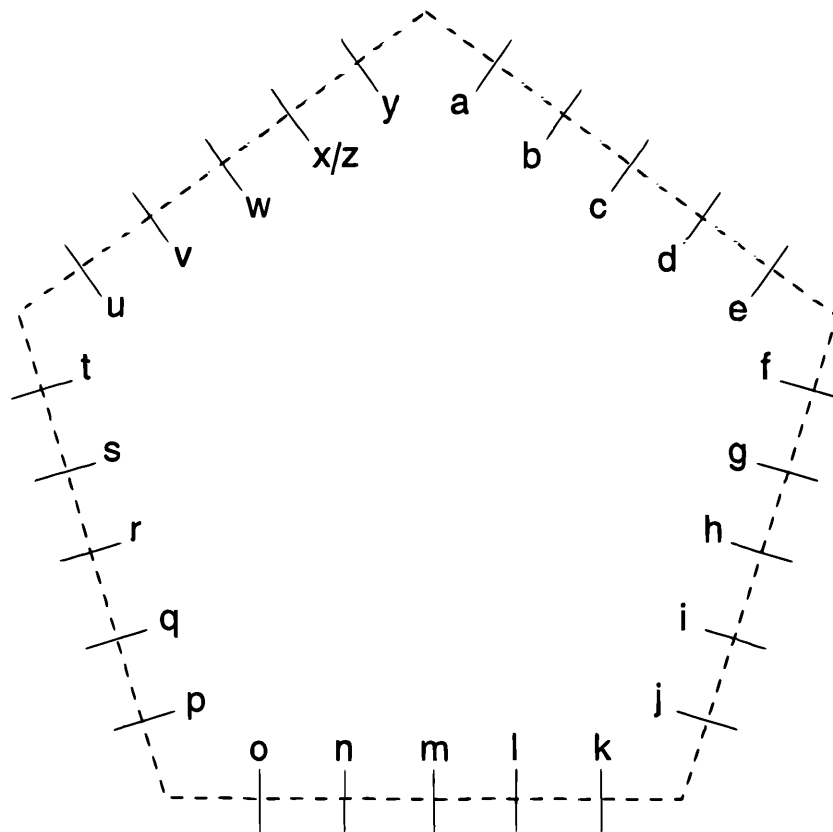
$$(y + f) - h = w$$

Can you find another equation like it?

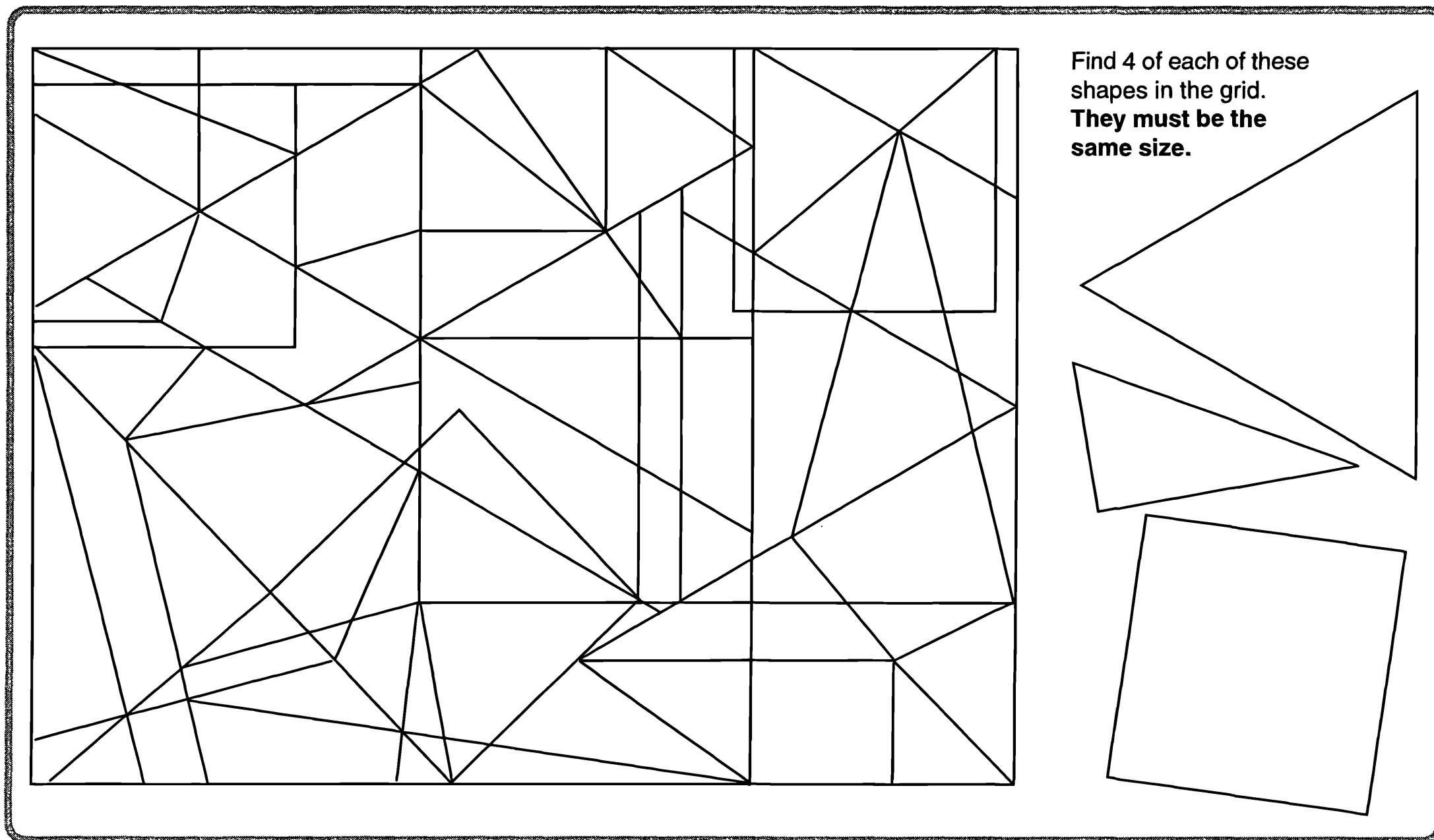
# Number Codex



-----  
Cut out this Rotatable Pentagon carefully so that it will fit on the frame above.



# Hidden Shapes



Find 4 of each of these shapes in the grid. They must be the same size.



# Cross Puzzles

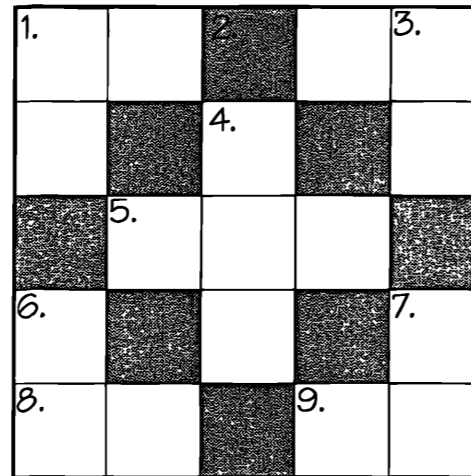
Use the clues to solve these two cross puzzles.

### Clues across

1.  $20 - 3$
2.  $1 + 3 + 5 + 7 + 9$
5. Two hundred and sixty-four
8. One less than 70
9.  $10 \times 10 - 1$

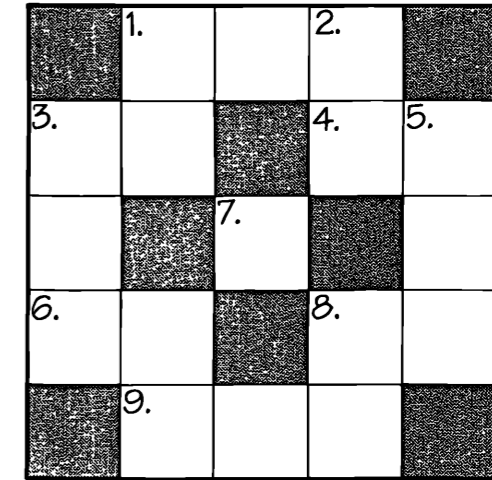
### Clues down

1. Number of hours from midnight to noon.
3. Half of a hundred.
4.  $188 + 100 + 78$
6.  $2 \times 2 \times 2 \times 2$
7.  $7 \times 7$



### Clues across

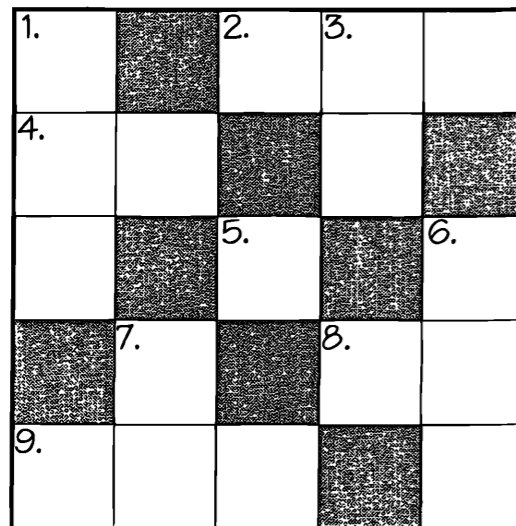
1.  $100 + 10 + 1$
3. Number of hours in one day.
4.  $2 \times 2 \times 2 \times 2 \times 2$
6. Half of 10
7.  $6 \times 10$
8.  $3 \times 3 \times 3$
9.  $110 - 5$



### Clues down

1.  $8 + 6$
2.  $6\frac{1}{2} \times 2$
3.  $6 \times 6 \times 6$
5. 3 less than 300
8.  $9 + 7 + 5 + 3 + 1$

Use the grid below to invent a cross puzzle of your own.



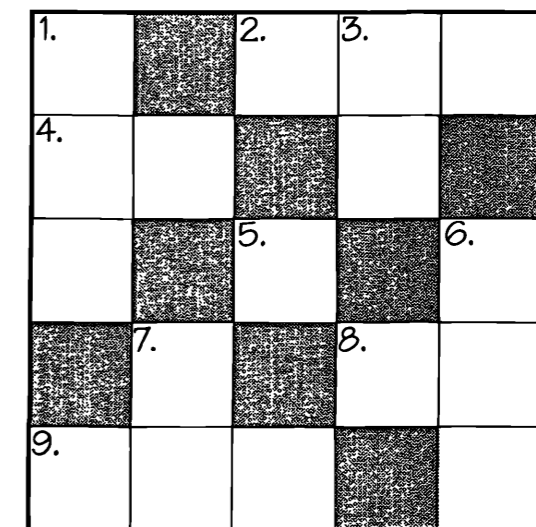
Write the clues and give it to someone else to solve.

### Clues across

1. \_\_\_\_\_
2. \_\_\_\_\_
4. \_\_\_\_\_
8. \_\_\_\_\_
9. \_\_\_\_\_

### Clues down

1. \_\_\_\_\_
3. \_\_\_\_\_
5. \_\_\_\_\_
6. \_\_\_\_\_
7. \_\_\_\_\_



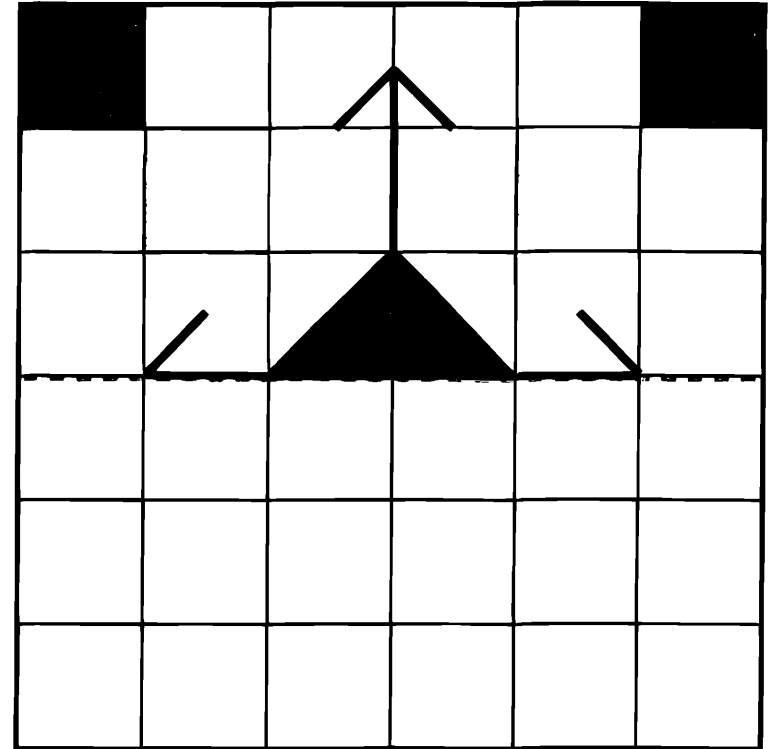
Reflection  
Reflection

You will need squared paper,  
colours and a mirror.

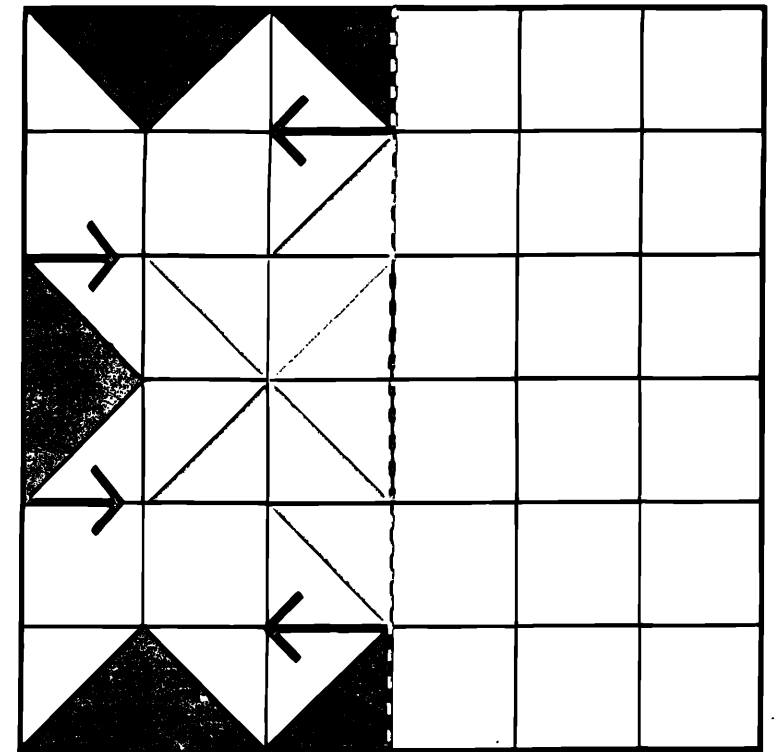
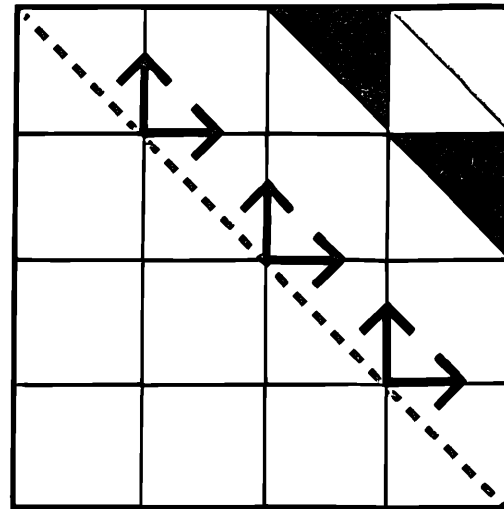
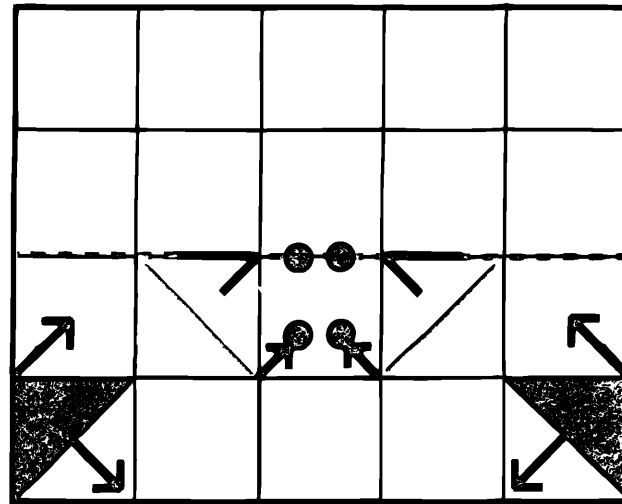
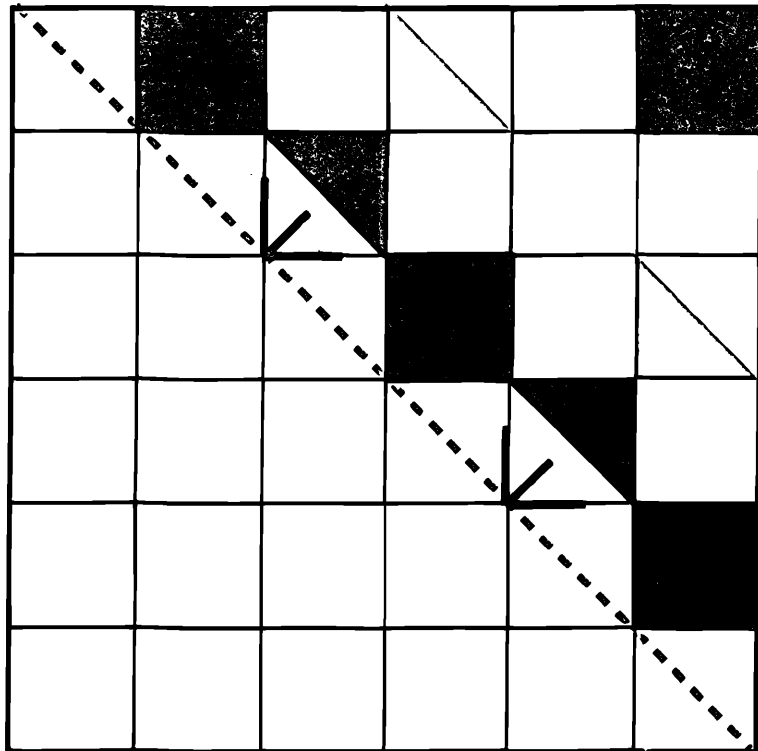
Copy this pattern on to  
squared paper.

Put the mirror on the dotted  
line and look at the  
reflection.

Remove the mirror and  
draw in the reflected  
pattern.

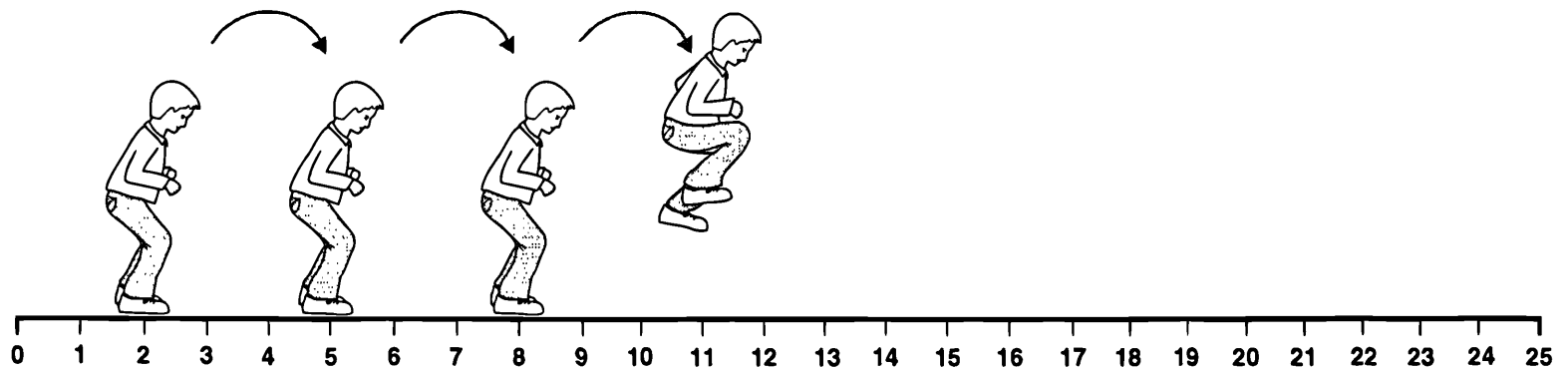


Copy at least two of these patterns and draw in their reflections.



Design a pattern of your own and then reflect it.

# Jumping Jack



Jack jumped from 2 to 5 and then to 8.

How many spaces did he clear at each jump?

Where will he land if he makes another similar jump?

Where will yet another jump take him?

These jumps form a sequence 2, 5, 8, \_\_\_\_\_, \_\_\_\_\_, . . . .

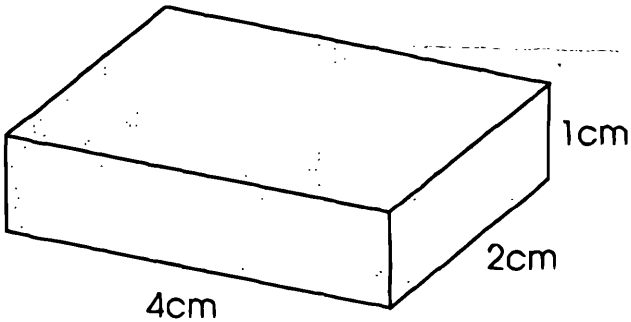
Fill in the next two missing numbers in the sequence.

Give the next two numbers in each of the following sequences.  
The number line at the top may help you.

- 1) 1, 6, 11, \_\_\_\_\_, \_\_\_\_\_, . . . .
- 2) 12, 15, 18, \_\_\_\_\_, \_\_\_\_\_, . . . .
- 3) 2, 6, 10, \_\_\_\_\_, \_\_\_\_\_, . . . .
- 4) 7, 11, 15, \_\_\_\_\_, \_\_\_\_\_, . . . .
- 5) 9, 13, 17, \_\_\_\_\_, \_\_\_\_\_, . . . .
- 6) 1, 7, 13, \_\_\_\_\_, \_\_\_\_\_, . . . .
- 7) 3, 8, 13, \_\_\_\_\_, \_\_\_\_\_, . . . .
- 8) 4, 7, 10, \_\_\_\_\_, \_\_\_\_\_, . . . .
- 9) 5, 8, 11, \_\_\_\_\_, \_\_\_\_\_, . . . .
- 10) 6, 9, 12, \_\_\_\_\_, \_\_\_\_\_, . . . .

# Cuboid Nets

You will need : cm square paper,  
scissors, sellotape.



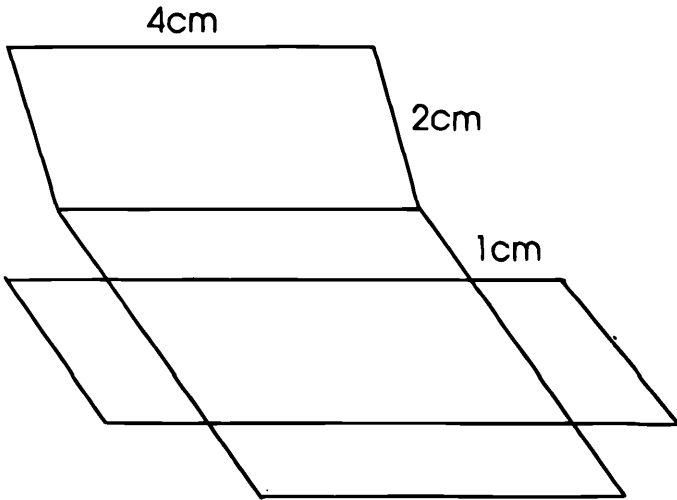
Look at this box. It is called a **cuboid**.

*How many faces has it?*

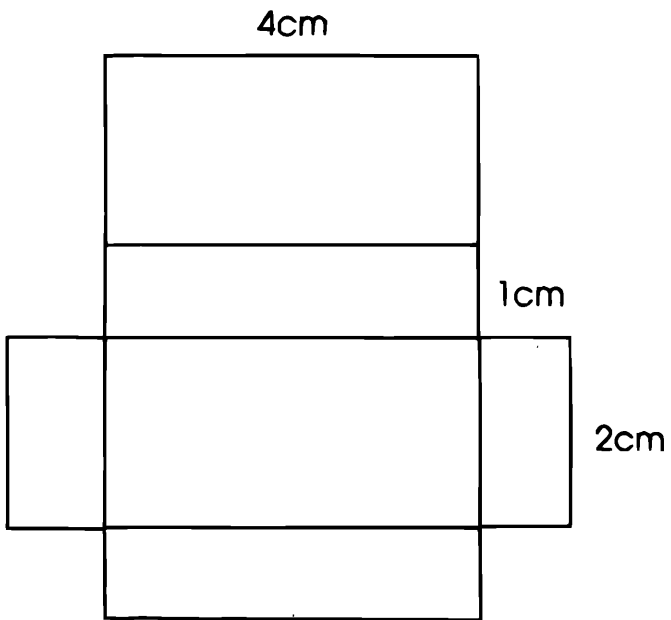
*What shape are they?*



Opening out the cuboid gives . . .

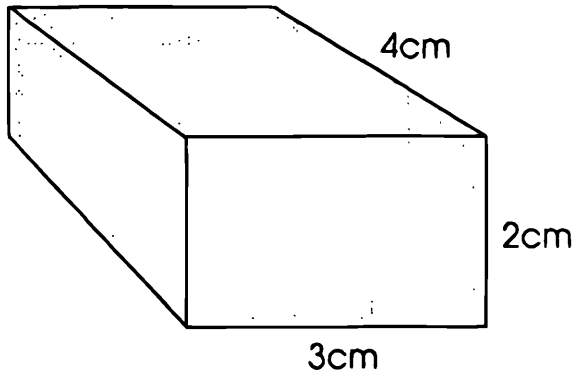


... this net.



Draw the net accurately, cut it out and fold it into a cuboid.

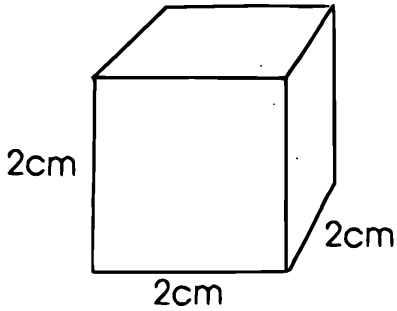
1) Draw the net of this cuboid.



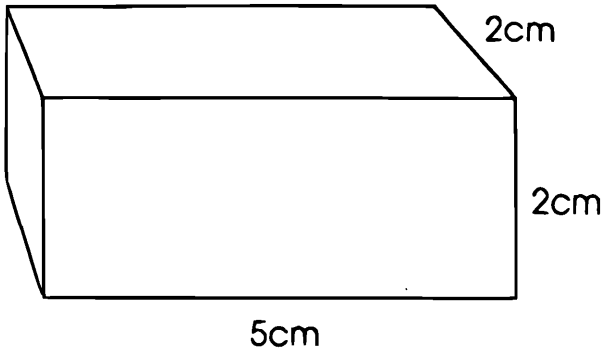
Check that your net is correct by cutting and folding.



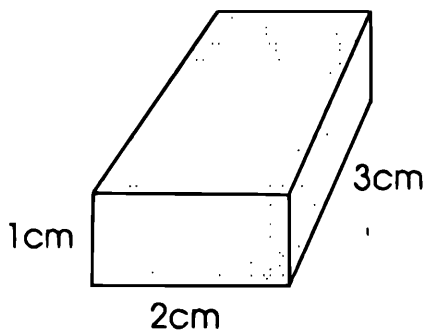
Draw the nets of these cuboids. Check that they are correct by cutting and folding.



3)



4)



5)

