

Exploring Rules

- 1 Complete the set of Find a Rule cards.

FRONT	BACK
2	12

FRONT	BACK
5	30

FRONT	BACK
3	18

FRONT	BACK
1	6

FRONT	BACK
6	36

FRONT	BACK
4	

-
- 2 Make a table to show the data from the cards.

-
- 3 If you know the number on the back of a card from the set in Problem 1, how can you find the number on the front of the card?
-

Finding Two Rules

The school store sells boxes that contain both pens and pencils. The boxes are all the same.

1 Complete the FAR cards to show the numbers of pens and pencils in different numbers of boxes.

A

boxes	pens
2	4
	pencils
	6

B

boxes	pens
6	
	pencils

C

boxes	pens
3	6
	pencils
	9

D

boxes	pens
1	
	pencils

E

boxes	pens
5	10
	pencils
	15

F

boxes	pens
10	
	pencils

G

boxes	pens
8	
	pencils

H

boxes	pens
7	
	pencils

I

boxes	pens
	18
	pencils
	27

2 If you know the number of boxes, how can you find the number of pens?

3 If you know the number of boxes, how can you find the number of pencils?

Rules That Use More Than One Input

1 Complete the table.

INPUTS	RULE A	RULE B	RULE C
3, 5	8	10	
1, 4	5		10
4, 6	10	12	20
10, 1		13	22
9, 6			
8, 6			
3, 9			
5, 15			
9, 9			

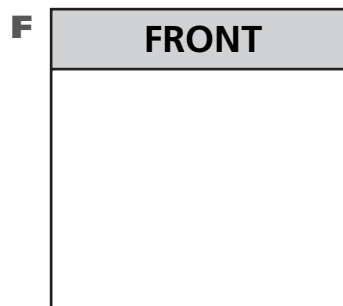
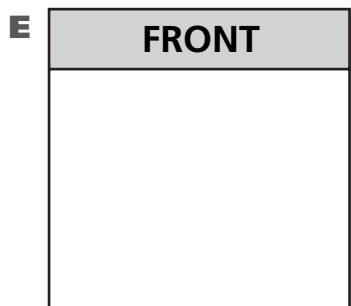
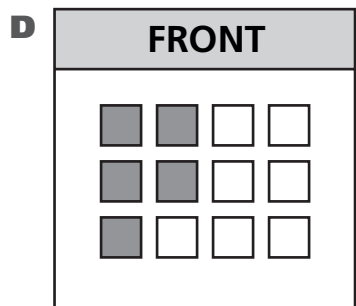
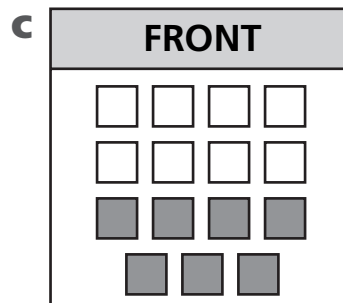
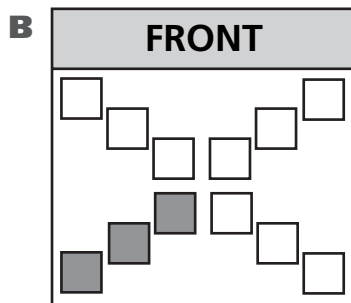
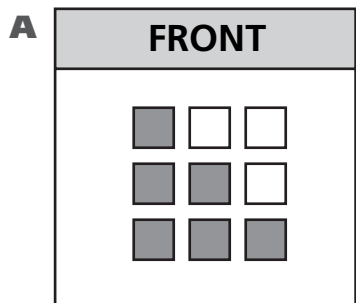
2 What do you do with the inputs to get Rule A?

3 What do you do with the inputs to get Rule B?

4 What do you do with the inputs to get Rule C?

Cards with Three Rules

Only the fronts of these Find a Rule cards are shown. These cards use three rules. Complete the table below. Then complete the cards.




Card	Rule I	Rule II	Rule III
A	9	6	3
B	12	3	9
C		7	8
D			
E	8	5	3
F	10	4	

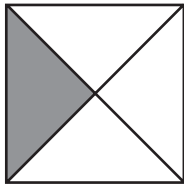
Recording Rules with Fractions

1 Complete the Find a Rule cards. Shade the pictures to match the numbers.

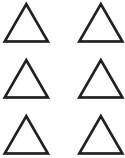
A

FRONT	BACK	
	Rule A $\frac{4}{5}$	Rule B $\frac{1}{5}$

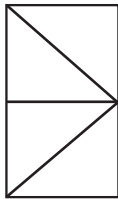
B

FRONT	BACK	
	Rule A $\frac{1}{4}$	Rule B $\frac{3}{4}$

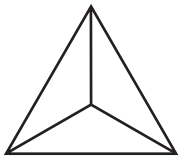
C

FRONT	BACK	
	Rule A $\frac{1}{6}$	Rule B $\frac{5}{6}$

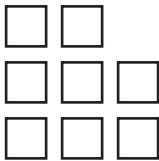
D

FRONT	BACK	
	Rule A $\frac{2}{4}$	Rule B $\frac{2}{4}$

E

FRONT	BACK	
	Rule A $\frac{0}{3}$	Rule B $\frac{3}{3}$

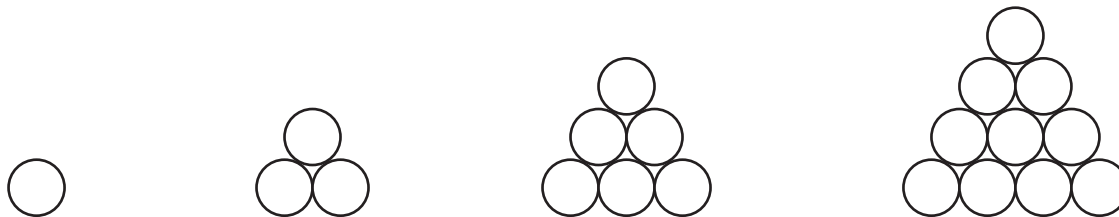
F

FRONT	BACK	
	Rule A $\frac{5}{8}$	Rule B $\frac{3}{\quad}$

2 If you know that the amount for Rule A is $\frac{2}{5}$, how can you figure out the amount for Rule B?

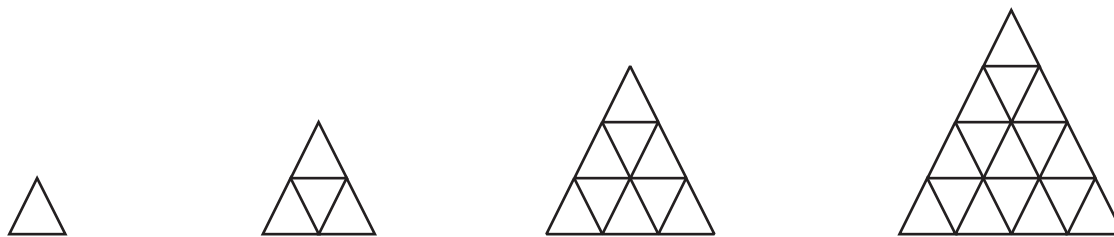
Patterns in Geometry



1



Describe the next figure following the pattern using words or pictures.

2



This figure is made up of 4 small triangles.
Three are like this:  and one is like this: .

How many small triangles ( or ) are in the next figure following the pattern? How do you know?

Patterns on the Number Line Hotel

The numbers are arranged to match the Number Line Hotel. Complete the shading pattern on the grid and then describe the pattern with at least 3 different rules.

80	81	82	83	84	85	86	87	88	89
70	71	72	73	74	75	76	77	78	79
60	61	62	63	64	65	66	67	68	69
50	51	52	53	54	55	56	57	58	59
40	41	42	43	44	45	46	47	48	49
30	31	32	33	34	35	36	37	38	39
20	21	22	23	24	25	26	27	28	29
10	11	12	13	14	15	16	17	18	19

Describe the pattern.

1

2

3

Finding Rules for Sharing Machines

Sharing Machine A shares groups of objects equally between two people.

Sharing Machine B shares groups of objects equally among three people.

The machines do not accept amounts that need to be cut in order to be shared.

- 1 Circle the amounts below that Sharing Machine A will share.
- 2 Draw a box around the amounts below that Sharing Machine B will share.

14 apples

21 erasers

23 lamps

17 rabbits

27 radios

5 cookies

26 pens

18 toy cars

1 dozen eggs

36 stickers

38 stamps

39 pencils

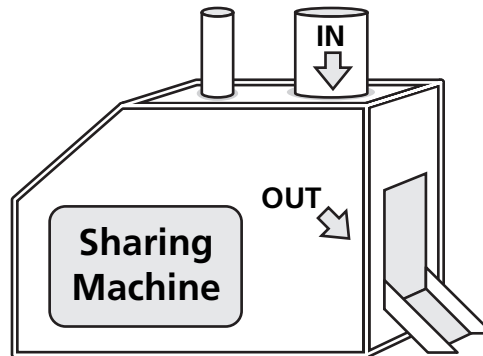
6 balls

33 muffins

- 3 Write an amount that could be shared by Sharing Machine A and Sharing Machine B. How do you know both machines will accept your amount?

More Rules with Sharing Machines

These machines cannot be adjusted. Each makes the same number of packages every time it is used. Unlike other machines, they can split objects.



SHARING MACHINE X

	Contents of Each Input Package	Number of Packages That Come Out	Contents of Each Output Package
1	12 coins		
2	3 dozen eggs	6	
3		6	2 whistles
4	2 packs of books, 18 in each pack		
5			11 blocks

SHARING MACHINE Y

	Contents of Each Input Package	Number of Packages That Come Out	Contents of Each Output Package
6			7 books
7			$3\frac{1}{2}$ rulers
8	9 pears		
9	3 dozen apples		18 apples
10	42 erasers		21 erasers

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Finding a Rule for an Unusual Machine

Find a rule and complete the table.

Use the following coins: (Q) (D) (N) (P)

INPUT	OUTPUT
(Q) (N)	
(Q) (D)	2 peaches and (N)
(D) (D) (D) (P)	2 peaches and (P)
	1 peach
(Q) (Q)	
(D) (P) (P) (P) (P) (P)	
	1 peach and (N)
(Q) (N) (D)	2 peaches and (D)
	3 peaches