

# PA3-1: Counting

Tom finds the **difference** between 9 and 6 by counting on his fingers. He says “6” with his fist closed, then counts to 9, raising one finger at a time.



When he says “9”, he has raised 3 fingers. So the difference or “gap” between 9 and 6 is 3.

1. Count the gap between the numbers. Write your answer in the circle. (If you know your subtraction facts, you may find the answer without counting.)

a) 2  4

b) 3  5

c) 5  8

d) 6  8



e) 4  5

f) 3  4

g) 4  6

h) 7  9

i) 2  5

j) 3  6

k) 1  4

l) 4  7

m) 5  10

n) 1  6

o) 5  7

p) 2  7

q) 5  9

r) 3  7

s) 7  10

t) 6  9

## BONUS

u) 19  21

v) 8  12

w) 28  32

x) 17  22

y) 19  23

z) 46  51

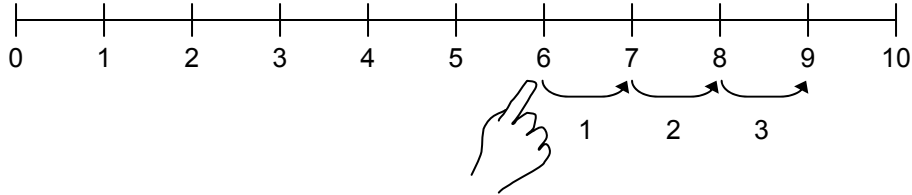
aa) 37  40

bb) 99  101

What number added to 6 gives 9?

$$6 + \boxed{\phantom{?}} = 9$$

Anne finds the answer using a **number line**. She puts her finger on 6 and counts the number of spaces between 6 and 9.



She counts 3 spaces, so:

$$6 + \boxed{3} = 9$$

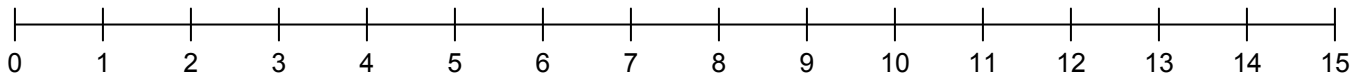
and:

9 is **3 more than** 6

and:

3 is called the **difference** between 9 and 6

2. Use the following number line to find the difference between the two numbers. Write your answer in the box.



a)  $3 + \boxed{\phantom{0}} = 5$

b)  $2 + \boxed{\phantom{0}} = 6$

c)  $4 + \boxed{\phantom{0}} = 7$

d)  $8 + \boxed{\phantom{0}} = 10$

e)  $7 + \boxed{\phantom{0}} = 12$

f)  $11 + \boxed{\phantom{0}} = 14$

g)  $10 + \boxed{\phantom{0}} = 12$

h)  $4 + \boxed{\phantom{0}} = 5$

i)  $12 + \boxed{\phantom{0}} = 15$

j)  $13 + \boxed{\phantom{0}} = 15$

k)  $2 + \boxed{\phantom{0}} = 8$

l)  $9 + \boxed{\phantom{0}} = 14$

m)  $\boxed{\phantom{0}} + 12 = 14$

n)  $3 + \boxed{\phantom{0}} = 10$

o)  $\boxed{\phantom{0}} + 8 = 11$

BONUS

p)  $\boxed{\phantom{0}} + 3 = 12$

q)  $1 + \boxed{\phantom{0}} = 9$

r)  $2 + \boxed{\phantom{0}} = 12$

s)  $\boxed{\phantom{0}} + 8 = 14$

t)  $4 + \boxed{\phantom{0}} = 11$

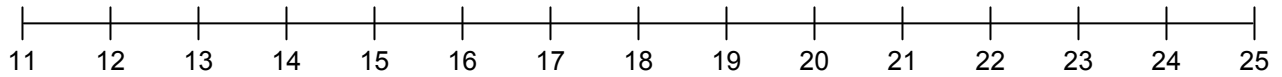
u)  $6 + \boxed{\phantom{0}} = 15$

v)  $\boxed{\phantom{0}} + 6 = 15$

w)  $\boxed{\phantom{0}} + 4 = 14$

x)  $3 + \boxed{\phantom{0}} = 15$

3. Use the following number line to find the difference between the two numbers. Write your answer in the circle.



a) 12  15

b) 13  17

c) 11  14

d) 22  24

e) 19  23

f) 17  18

g) 14  21

h) 15  19

i) 16  20

j) 13  19

k) 11  15

l) 17  24

m) 13  16

n) 12  17

o) 21  23

p) 18  22

q) 13  23

r) 14  22

s) 11  19

t) 12  24

4. Fill in the missing number.

**HINT:** Use the number line to find the difference between the smaller and the larger number.

a) 15 is \_\_\_\_\_ more than 13

b) 20 is \_\_\_\_\_ more than 17

c) 23 is \_\_\_\_\_ more than 16

d) 22 is \_\_\_\_\_ more than 19

e) 18 is \_\_\_\_\_ more than 15

f) 16 is \_\_\_\_\_ more than 15

g) 20 is \_\_\_\_\_ more than 19

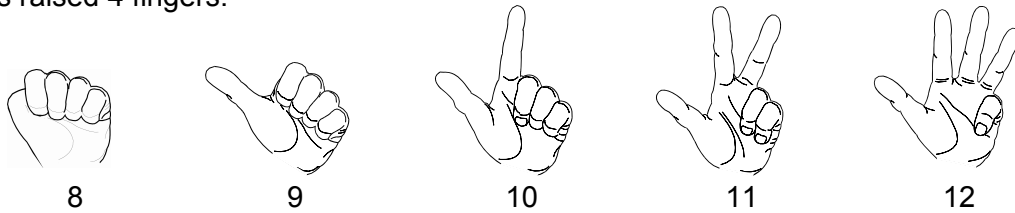
h) 17 is \_\_\_\_\_ more than 13

i) 23 is \_\_\_\_\_ more than 18

## PA3-2: Preparation for Increasing Sequences

What number is 4 more than 8? (Or: What is  $8 + 4$ ?)

Carlo finds the answer by counting on his fingers. He says "8" with his fist closed, then counts up from 8 until he has raised 4 fingers.



The number 12 is 4 more than 8.

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1. Add the number in the circle to the number beside it. Write your answer in the blank.

- a) 3  $\textcircled{4}$  \_\_\_\_\_      b) 9  $\textcircled{2}$  \_\_\_\_\_      c) 6  $\textcircled{3}$  \_\_\_\_\_      d) 4  $\textcircled{4}$  \_\_\_\_\_  
e) 7  $\textcircled{5}$  \_\_\_\_\_      f) 6  $\textcircled{4}$  \_\_\_\_\_      g) 2  $\textcircled{8}$  \_\_\_\_\_      h) 9  $\textcircled{6}$  \_\_\_\_\_  
i) 10  $\textcircled{8}$  \_\_\_\_\_      j) 17  $\textcircled{9}$  \_\_\_\_\_      k) 14  $\textcircled{7}$  \_\_\_\_\_      l) 12  $\textcircled{5}$  \_\_\_\_\_

### BONUS

- m) 27  $\textcircled{2}$  \_\_\_\_\_      n) 35  $\textcircled{5}$  \_\_\_\_\_      o) 52  $\textcircled{3}$  \_\_\_\_\_      p) 47  $\textcircled{4}$  \_\_\_\_\_  
q) 36  $\textcircled{6}$  \_\_\_\_\_      r) 82  $\textcircled{5}$  \_\_\_\_\_      s) 97  $\textcircled{4}$  \_\_\_\_\_      t) 95  $\textcircled{8}$  \_\_\_\_\_

2. Fill in the missing numbers.

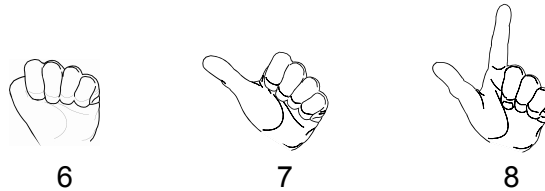
- a) \_\_\_\_\_ is 3 more than 6      b) \_\_\_\_\_ is 2 more than 7      c) \_\_\_\_\_ is 4 more than 6  
d) \_\_\_\_\_ is 1 more than 8      e) \_\_\_\_\_ is 5 more than 4      f) \_\_\_\_\_ is 4 more than 13  
g) \_\_\_\_\_ is 6 more than 9      h) \_\_\_\_\_ is 7 more than 7      i) \_\_\_\_\_ is 5 more than 17

# PA3-3: Increasing Sequences

Tara wants to continue the number pattern.

$$6, 8, 10, 12, \underline{\quad}$$

She finds the **difference** between the first two numbers by counting on her fingers. She says “6” with her fist closed and counts until she reaches 8.



She has raised 2 fingers so the difference between 6 and 8 is 2.

$$6, 8, 10, 12, \underline{\quad}$$

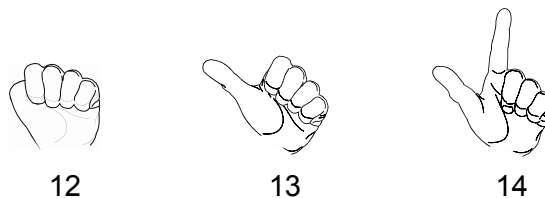
(2)

She checks that the difference between the other numbers is 2.

$$6, 8, 10, 12, \underline{\quad}$$

(2) (2) (2)

To continue the pattern, Tara adds 2 to the last number in the sequence. She says “12” with her fist closed and counts up until she has raised 2 fingers.



$$6, 8, 10, 12, \underline{14}$$

(2) (2) (2) (2)

1. Extend the following patterns.

**NOTE:** It is important to start by finding the gap between the numbers.

a) 1 ○, 3 ○, 5 ○, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

b) 0 ○, 2 ○, 4 ○, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

c) 2 ○, 5 ○, 8 ○, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

d) 0 ○, 3 ○, 6 ○, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

e) 0 , 5 , 10 ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$

f) 5 , 7 , 9 ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$

g) 3 , 7 , 11 ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$

h) 2 , 6 , 10 ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$

i) 4 , 8 , 12 ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$

j) 10 , 15 , 20 ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$

k) 1 , 4 , 7 ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$

l) 5 , 9 , 13 ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$

m) 11 , 13 , 15 ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$

BONUS

2. Extend the following patterns.

a) 1 , 6 , 11 ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$

b) 5 , 12 , 19 ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$

c) 21 , 24 , 27 ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$

d) 86 , 88 , 90 ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$  ,  $\bigcirc$

Use increasing sequences to solve these problems.

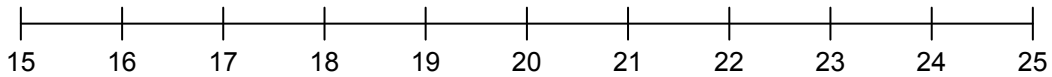
3. Mary reads 3 pages of her book each night.  
Last night she was on page 34.  
What page will she reach tonight?



4. Jane runs 10 blocks on Monday.  
Each day she runs 2 blocks further than the day before.  
How far does she run on Wednesday?

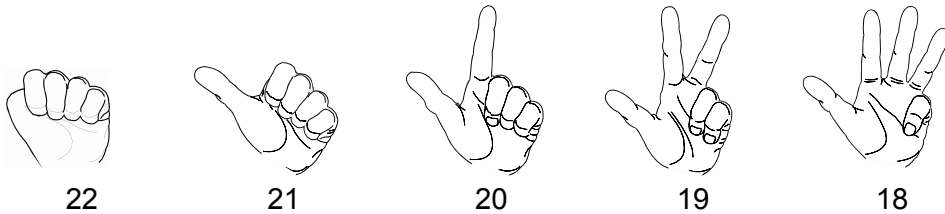


# PA3-4: Counting Backwards



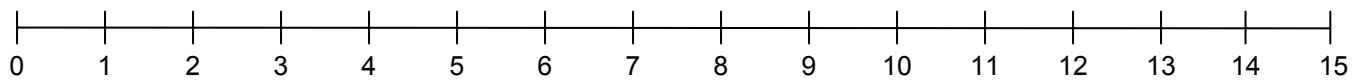
What number must you **subtract** from 22 to get 18?

Dana finds the answer by counting backwards on her fingers. She uses the number line to help.



Dana has raised 4 fingers. So 4 subtracted from 22 gives 18.

1. What number must you subtract from the bigger number to get the smaller number?



a)  $7 \begin{array}{c} \bigcirc \\ - 3 \\ \bigcirc \end{array} 4$

b)  $6 \begin{array}{c} \bigcirc \\ \bigcirc \end{array} 3$

c)  $9 \begin{array}{c} \bigcirc \\ \bigcirc \end{array} 7$

d)  $5 \begin{array}{c} \bigcirc \\ \bigcirc \end{array} 1$

e)  $8 \begin{array}{c} \bigcirc \\ \bigcirc \end{array} 4$

f)  $10 \begin{array}{c} \bigcirc \\ \bigcirc \end{array} 5$

g)  $12 \begin{array}{c} \bigcirc \\ \bigcirc \end{array} 9$

h)  $5 \begin{array}{c} \bigcirc \\ \bigcirc \end{array} 4$

i)  $10 \begin{array}{c} \bigcirc \\ \bigcirc \end{array} 4$

j)  $14 \begin{array}{c} \bigcirc \\ \bigcirc \end{array} 9$

k)  $5 \begin{array}{c} \bigcirc \\ \bigcirc \end{array} 2$

l)  $12 \begin{array}{c} \bigcirc \\ \bigcirc \end{array} 4$

m)  $13 \begin{array}{c} \bigcirc \\ \bigcirc \end{array} 9$

n)  $15 \begin{array}{c} \bigcirc \\ \bigcirc \end{array} 11$

o)  $12 \begin{array}{c} \bigcirc \\ \bigcirc \end{array} 10$

p)  $12 \begin{array}{c} \bigcirc \\ \bigcirc \end{array} 6$

q)  $13 \begin{array}{c} \bigcirc \\ \bigcirc \end{array} 5$

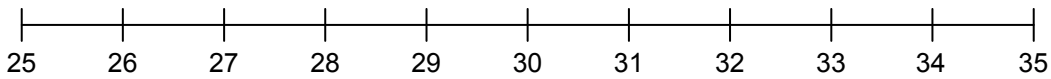
r)  $14 \begin{array}{c} \bigcirc \\ \bigcirc \end{array} 7$

s)  $15 \begin{array}{c} \bigcirc \\ \bigcirc \end{array} 5$

t)  $11 \begin{array}{c} \bigcirc \\ \bigcirc \end{array} 2$

u)  $10 \begin{array}{c} \bigcirc \\ \bigcirc \end{array} 2$

2. Find the gap between the numbers by counting backwards on your fingers.



a) 32  $\text{\textcircled{-4}}$  28

b) 31  $\text{\textcircled{\quad}}$  29

c) 32  $\text{\textcircled{\quad}}$  27

d) 31  $\text{\textcircled{\quad}}$  27

e) 30  $\text{\textcircled{\quad}}$  26

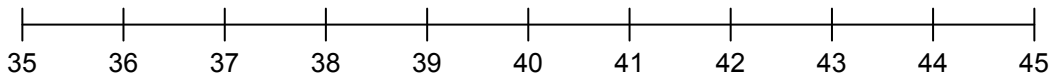
f) 33  $\text{\textcircled{\quad}}$  26

g) 28  $\text{\textcircled{\quad}}$  26

h) 32  $\text{\textcircled{\quad}}$  25

i) 34  $\text{\textcircled{\quad}}$  26

3. Find the gap between the numbers by counting backwards on your fingers.



a) 43  $\text{\textcircled{-4}}$  39

b) 41  $\text{\textcircled{\quad}}$  39

c) 43  $\text{\textcircled{\quad}}$  37

d) 41  $\text{\textcircled{\quad}}$  38

e) 40  $\text{\textcircled{\quad}}$  36

f) 42  $\text{\textcircled{\quad}}$  35

g) 41  $\text{\textcircled{\quad}}$  37

h) 45  $\text{\textcircled{\quad}}$  38

i) 44  $\text{\textcircled{\quad}}$  36

4. Find the gap between the numbers by counting backwards on your fingers (or by using your subtraction facts).

a) 56  $\text{\textcircled{\quad}}$  51

b) 59  $\text{\textcircled{\quad}}$  57

c) 50  $\text{\textcircled{\quad}}$  48

d) 68  $\text{\textcircled{\quad}}$  61

e) 60  $\text{\textcircled{\quad}}$  58

f) 70  $\text{\textcircled{\quad}}$  68

g) 72  $\text{\textcircled{\quad}}$  68

h) 81  $\text{\textcircled{\quad}}$  79

i) 83  $\text{\textcircled{\quad}}$  78

j) 128  $\text{\textcircled{\quad}}$  125

k) 167  $\text{\textcircled{\quad}}$  162

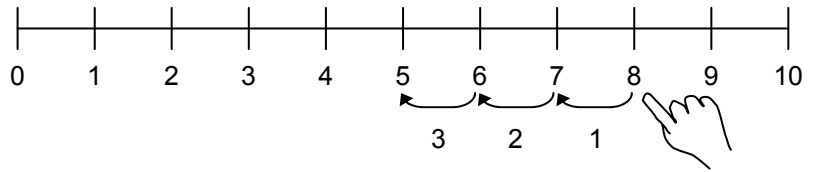
l) 181  $\text{\textcircled{\quad}}$  178

# PA3-4: Counting Backwards *(continued)*

What number **subtracted** from 8 gives 5?

$$8 - \boxed{?} = 5$$

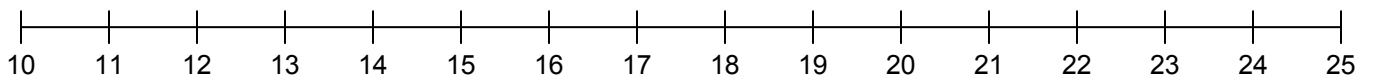
Rita puts her finger on 8 on a **number line**.



She counts (backward 3 spaces to 5) to find the number of spaces between 8 and 5.

so:  $8 - \boxed{3} = 5$       and: 5 is 3 **less than** 8

5. Use the number line to find the difference between the two numbers. Write your answer in the box.



a)  $17 - \boxed{\phantom{00}} = 14$

b)  $15 - \boxed{\phantom{00}} = 13$

c)  $21 - \boxed{\phantom{00}} = 18$

d)  $17 - \boxed{\phantom{00}} = 12$

e)  $19 - \boxed{\phantom{00}} = 14$

f)  $17 - \boxed{\phantom{00}} = 13$

g)  $18 - \boxed{\phantom{00}} = 16$

h)  $21 - \boxed{\phantom{00}} = 20$

i)  $24 - \boxed{\phantom{00}} = 21$

j)  $20 - \boxed{\phantom{00}} = 14$

k)  $21 - \boxed{\phantom{00}} = 17$

l)  $19 - \boxed{\phantom{00}} = 13$

m)  $15 - \boxed{\phantom{00}} = 12$

n)  $16 - \boxed{\phantom{00}} = 14$

o)  $18 - \boxed{\phantom{00}} = 14$

p)  $21 - \boxed{\phantom{00}} = 15$

q)  $20 - \boxed{\phantom{00}} = 12$

r)  $17 - \boxed{\phantom{00}} = 16$

## BONUS

6. Fill in the missing number.

a) 17 is \_\_\_\_\_ less than 20

b) 11 is \_\_\_\_\_ less than 15

c) 16 is \_\_\_\_\_ less than 21

d) 19 is \_\_\_\_\_ less than 21

e) 18 is \_\_\_\_\_ less than 24

f) 15 is \_\_\_\_\_ less than 22

g) 14 is \_\_\_\_\_ less than 19

h) 13 is \_\_\_\_\_ less than 21

i) 12 is \_\_\_\_\_ less than 15

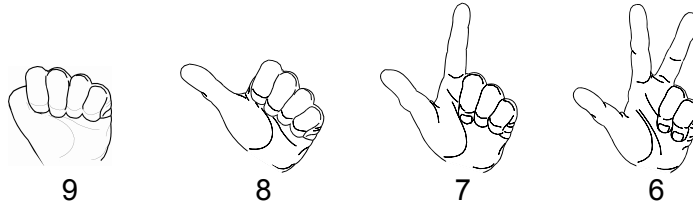
# PA3-5: Preparation for Decreasing Sequences

What number is 3 less than 9?

$$9 - 3 = \boxed{?}$$

Aron finds the answer by counting on his fingers.

He says "9" with his fist closed and counts backwards until he has raised 3 fingers.



The number 6 is 3 less than 9.

1. Subtract the number in the circle from the number beside it. Write your answer in the blank.

- a) 5  $\textcircled{-2}$  \_\_\_\_\_      b) 9  $\textcircled{-3}$  \_\_\_\_\_      c) 8  $\textcircled{-4}$  \_\_\_\_\_      d) 7  $\textcircled{-1}$  \_\_\_\_\_  
e) 7  $\textcircled{-5}$  \_\_\_\_\_      f) 6  $\textcircled{-4}$  \_\_\_\_\_      g) 3  $\textcircled{-1}$  \_\_\_\_\_      h) 11  $\textcircled{-2}$  \_\_\_\_\_  
i) 10  $\textcircled{-6}$  \_\_\_\_\_      j) 13  $\textcircled{-2}$  \_\_\_\_\_      k) 19  $\textcircled{-4}$  \_\_\_\_\_      l) 18  $\textcircled{-3}$  \_\_\_\_\_

BONUS

- m) 28  $\textcircled{-4}$  \_\_\_\_\_      n) 35  $\textcircled{-6}$  \_\_\_\_\_      o) 57  $\textcircled{-8}$  \_\_\_\_\_      p) 62  $\textcircled{-4}$  \_\_\_\_\_  
q) 87  $\textcircled{-4}$  \_\_\_\_\_      r) 48  $\textcircled{-2}$  \_\_\_\_\_      s) 92  $\textcircled{-5}$  \_\_\_\_\_      t) 100  $\textcircled{-3}$  \_\_\_\_\_

2. Fill in the missing numbers.

- a) \_\_\_\_\_ is 4 less than 7      b) \_\_\_\_\_ is 2 less than 9      c) \_\_\_\_\_ is 3 less than 8  
d) \_\_\_\_\_ is 5 less than 17      e) \_\_\_\_\_ is 4 less than 20      f) \_\_\_\_\_ is 6 less than 25  
g) \_\_\_\_\_ is 7 less than 28      h) \_\_\_\_\_ is 4 less than 32      i) \_\_\_\_\_ is 5 less than 40  
j) \_\_\_\_\_ is 8 less than 59      k) \_\_\_\_\_ is 6 less than 63      l) \_\_\_\_\_ is 4 less than 78

# PA3-6: Decreasing Sequences

1. Extend the **decreasing** patterns.

**NOTE:** It is important to start by finding the gap between the numbers.

*Example:*

$$11 \quad \bigcirc \quad 9 \quad \bigcirc \quad 7 \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc$$

Step 1:

$$11 \quad \bigcirc \begin{matrix} -2 \\ \bigcirc \end{matrix} \quad 9 \quad \bigcirc \begin{matrix} -2 \\ \bigcirc \end{matrix} \quad 7 \quad \bigcirc \begin{matrix} -2 \\ \bigcirc \end{matrix} \quad \underline{\quad} \quad \bigcirc \begin{matrix} -2 \\ \bigcirc \end{matrix} \quad \underline{\quad} \quad \bigcirc \begin{matrix} -2 \\ \bigcirc \end{matrix} \quad \underline{\quad} \quad \bigcirc \begin{matrix} -2 \\ \bigcirc \end{matrix}$$

Step 2:

$$11 \quad \bigcirc \begin{matrix} -2 \\ \bigcirc \end{matrix} \quad 9 \quad \bigcirc \begin{matrix} -2 \\ \bigcirc \end{matrix} \quad 7 \quad \bigcirc \begin{matrix} -2 \\ \bigcirc \end{matrix} \quad \underline{5} \quad \bigcirc \begin{matrix} -2 \\ \bigcirc \end{matrix} \quad \underline{3} \quad \bigcirc \begin{matrix} -2 \\ \bigcirc \end{matrix} \quad \underline{1}$$

a)  $10 \quad \bigcirc \quad 9 \quad \bigcirc \quad 8 \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc$

b)  $14 \quad \bigcirc \quad 12 \quad \bigcirc \quad 10 \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc$

c)  $23 \quad \bigcirc \quad 22 \quad \bigcirc \quad 21 \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc$

d)  $24 \quad \bigcirc \quad 21 \quad \bigcirc \quad 18 \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc$

e)  $90 \quad \bigcirc \quad 80 \quad \bigcirc \quad 70 \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc$

f)  $45 \quad \bigcirc \quad 40 \quad \bigcirc \quad 35 \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc$

g)  $15 \quad \bigcirc \quad 13 \quad \bigcirc \quad 11 \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc$

h)  $33 \quad \bigcirc \quad 30 \quad \bigcirc \quad 27 \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc$

i)  $23 \quad \bigcirc \quad 21 \quad \bigcirc \quad 19 \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc$

j)  $28 \quad \bigcirc \quad 25 \quad \bigcirc \quad 22 \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc$

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k)  $95 \quad \bigcirc \quad 90 \quad \bigcirc \quad 85 \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc$

l)  $110 \quad \bigcirc \quad 100 \quad \bigcirc \quad 90 \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc$

m)  $44 \quad \bigcirc \quad 40 \quad \bigcirc \quad 36 \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc \quad \underline{\quad} \quad \bigcirc$

1. Extend the patterns, using the gap provided.

Example 1:

$$6, \overset{+1}{\circlearrowleft}, 7, \underline{8}, \underline{9}$$

Example 2:

$$8, \overset{-2}{\circlearrowleft}, 6, \underline{4}, \underline{2}$$

a)  $5, \overset{+5}{\circlearrowleft}, 10, \underline{\quad}, \underline{\quad}$

b)  $2, \overset{+3}{\circlearrowleft}, 5, \underline{\quad}, \underline{\quad}$

c)  $3, \overset{+3}{\circlearrowleft}, 6, \underline{\quad}, \underline{\quad}$

d)  $8, \overset{+2}{\circlearrowleft}, 10, \underline{\quad}, \underline{\quad}$

e)  $14, \overset{+2}{\circlearrowleft}, 16, \underline{\quad}, \underline{\quad}$

f)  $15, \overset{+5}{\circlearrowleft}, 20, \underline{\quad}, \underline{\quad}$

g)  $13, \overset{-1}{\circlearrowleft}, 12, \underline{\quad}, \underline{\quad}$

h)  $18, \overset{-2}{\circlearrowleft}, 16, \underline{\quad}, \underline{\quad}$

i)  $25, \overset{-5}{\circlearrowleft}, 20, \underline{\quad}, \underline{\quad}$

j)  $9, \overset{-2}{\circlearrowleft}, 7, \underline{\quad}, \underline{\quad}$

k)  $22, \overset{-3}{\circlearrowleft}, 19, \underline{\quad}, \underline{\quad}$

l)  $17, \overset{-4}{\circlearrowleft}, 13, \underline{\quad}, \underline{\quad}$

m)  $29, \overset{-5}{\circlearrowleft}, 24, \underline{\quad}, \underline{\quad}$

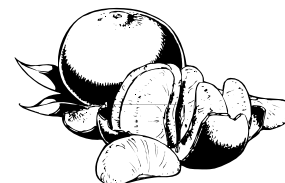
n)  $32, \overset{+5}{\circlearrowleft}, 37, \underline{\quad}, \underline{\quad}$

o)  $21, \overset{+3}{\circlearrowleft}, 24, \underline{\quad}, \underline{\quad}$

p)  $102, \overset{-2}{\circlearrowleft}, 100, \underline{\quad}, \underline{\quad}$

BONUS

2. Rachel has a box of 24 tangerines. She eats 3 each day for 5 days. How many are left?



3. Extend the patterns by first finding the gap.

**HINT:** You should first check that the gap is the same between each pair of numbers!

*Example:*

$$3 \quad \circ \quad 5 \quad \circ \quad 7 \quad , \quad \underline{\quad}$$

Step 1:

$$3 \quad \circ \quad +2 \quad \circ \quad 5 \quad \circ \quad +2 \quad \circ \quad 7 \quad , \quad \underline{\quad}$$

Step 2:

$$3 \quad \circ \quad +2 \quad \circ \quad 5 \quad \circ \quad +2 \quad \circ \quad 7 \quad , \quad \underline{9}$$

a)  $5 \quad \circ \quad 8 \quad \circ \quad 11 \quad , \quad \underline{\quad}$

b)  $2 \quad \circ \quad 4 \quad \circ \quad 6 \quad , \quad \underline{\quad}$

c)  $6 \quad \circ \quad 10 \quad \circ \quad 14 \quad , \quad \underline{\quad}$

d)  $1 \quad \circ \quad 3 \quad \circ \quad 5 \quad , \quad \underline{\quad}$

e)  $21 \quad \circ \quad 24 \quad \circ \quad 27 \quad , \quad \underline{\quad}$

f)  $12 \quad \circ \quad 17 \quad \circ \quad 22 \quad , \quad \underline{\quad}$

g)  $25 \quad \circ \quad 23 \quad \circ \quad 21 \quad , \quad \underline{\quad}$

h)  $29 \quad \circ \quad 24 \quad \circ \quad 19 \quad , \quad \underline{\quad}$

i)  $12 \quad \circ \quad 9 \quad \circ \quad 6 \quad , \quad \underline{\quad} \quad , \quad \underline{\quad}$

j)  $30 \quad \circ \quad 25 \quad \circ \quad 20 \quad , \quad \underline{\quad} \quad , \quad \underline{\quad}$

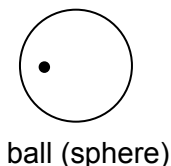
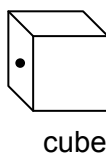
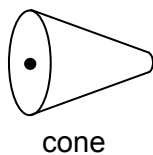
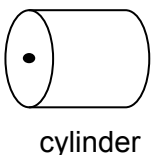
**BONUS**

k)  $45 \quad \circ \quad 48 \quad \circ \quad 51 \quad , \quad \underline{\quad}$

l)  $105 \quad \circ \quad 95 \quad \circ \quad 85 \quad , \quad \underline{\quad} \quad , \quad \underline{\quad}$

m)  $32 \quad \circ \quad 34 \quad \circ \quad 36 \quad , \quad \underline{\quad} \quad , \quad \underline{\quad} \quad , \quad \underline{\quad} \quad , \quad \underline{\quad} \quad , \quad \underline{\quad} \quad , \quad \underline{\quad} \quad , \quad \underline{\quad}$

Anne makes a pattern with beads. She uses 4 **shapes**.



She uses 3 **colours**:  
 red = R  
 yellow = Y  
 blue = B


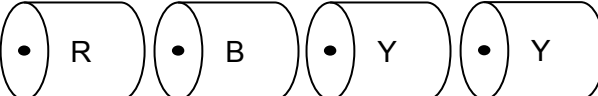


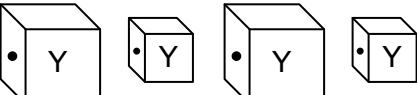
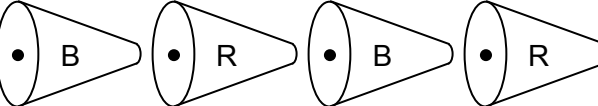
She uses 2 different **sizes**:  
 big  
 small

**TEACHER:**

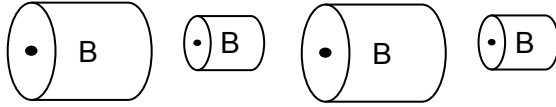
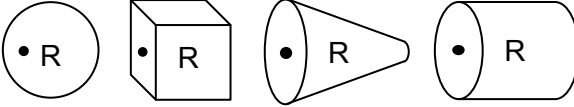
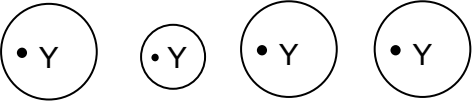
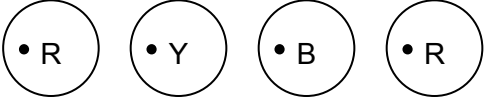
Make sure students understand that while the cylinders directly above are different sizes, they are still the same shape.

1. Circle the one attribute that changes in each pattern.

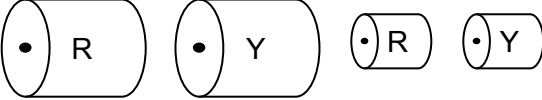
**HINT:** Check each attribute one at a time. First ask: “Does the shape change?” Then ask: “Does the colour change?” Then ask: “Does the size change?”

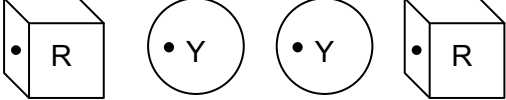
<p>a) </p> <p style="text-align: center;">shape      colour      size</p>	<p>b) </p> <p style="text-align: center;">shape      colour      size</p>
<p>c) </p> <p style="text-align: center;">shape      colour      size</p>	<p>d) </p> <p style="text-align: center;">shape      colour      size</p>
<p>e) </p> <p style="text-align: center;">shape      colour      size</p>	<p>f) </p> <p style="text-align: center;">shape      colour      size</p>

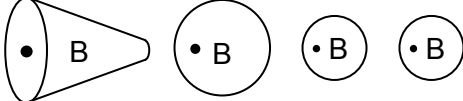
2. Write the one attribute that changes in each pattern.

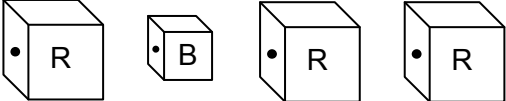
<p>a) </p> <hr/>	<p>b) </p> <hr/>
<p>c) </p> <hr/>	<p>d) </p> <hr/>

3. Circle the two attributes that change in each sequence.

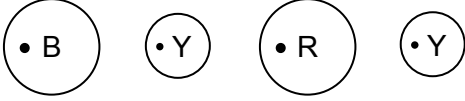
a)    
 shape      size      colour

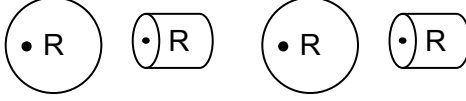
b)    
 shape      size      colour

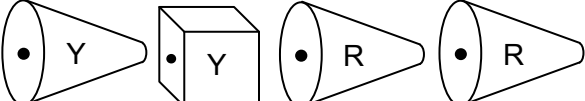
c)    
 shape      size      colour

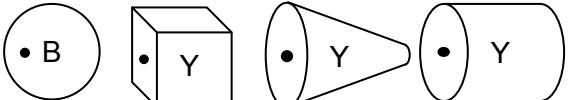
d)    
 shape      size      colour

4. Write the two attributes that change in each pattern.

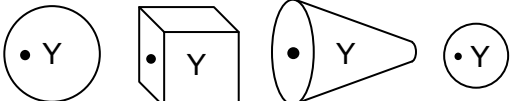
a)    
 \_\_\_\_\_

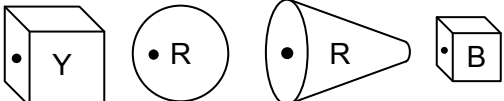
b)    
 \_\_\_\_\_

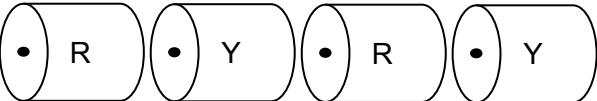
c)    
 \_\_\_\_\_

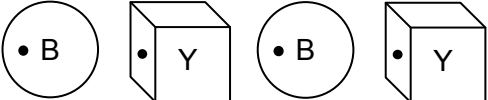
d)    
 \_\_\_\_\_

5. Write the one, two or three attributes that change in each sequence.

a)    
 \_\_\_\_\_   
 \_\_\_\_\_

b)    
 \_\_\_\_\_   
 \_\_\_\_\_

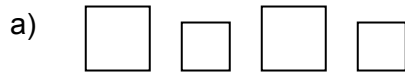
c)    
 \_\_\_\_\_   
 \_\_\_\_\_

d)    
 \_\_\_\_\_   
 \_\_\_\_\_

# PA3-9: Patterns Where Two Attributes Change

To make a pattern, you can change the colour, shape, size or position of a figure, or you can change the number of times a figure occurs.

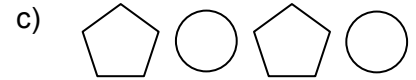
1. Circle the word that tells you which attribute of a figure or figures changes in the pattern.



shape position size



size position number



number colour shape



shape position number



position size number



size shape colour

2. Circle the two words that tell you which attributes of a figure or figures change in the pattern.



shape position size  
number colour

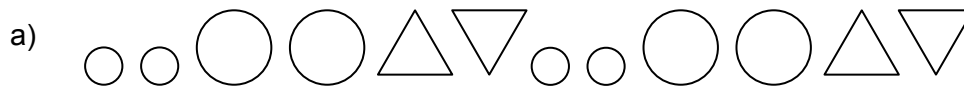


position size number  
shape colour

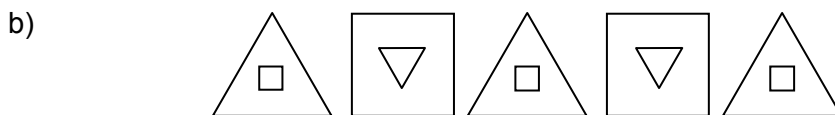


position size number  
shape colour

3. Circle the three words that tell you which attributes of a figure or figures change in the pattern.



position size number shape colour



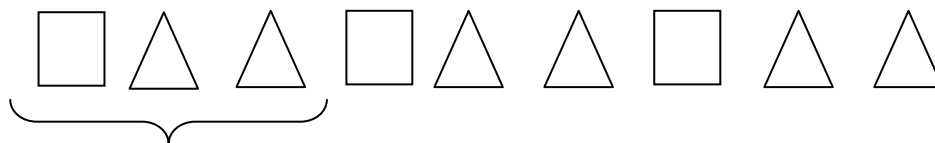
position size number shape colour



4. Below, make a pattern of your own, changing at least two attributes in the figure or figures. In your notebook, explain which attributes you used in making your pattern.

# PA3-10: Repeating Patterns

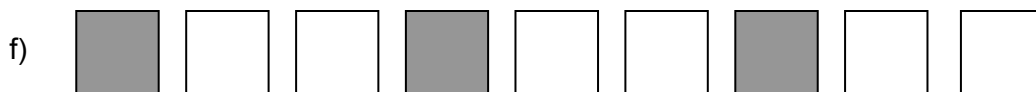
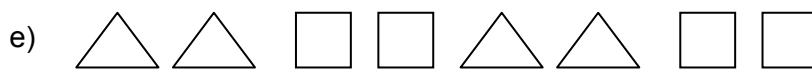
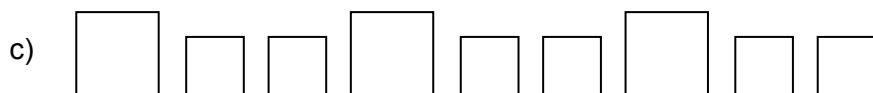
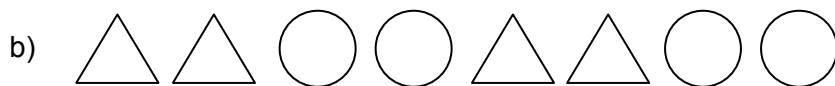
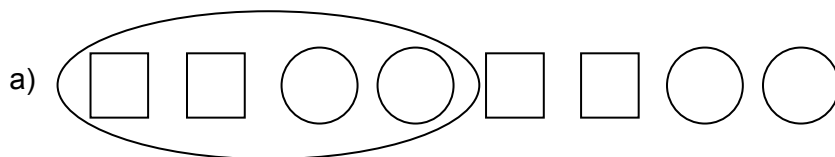
Kevin makes a **repeating** pattern using blocks.



This is the core of Kevin's pattern.

The **core** of a pattern is the part that repeats.

1. Circle the core of the following patterns.



i) A B B A B B A B B

j) 1 2 3 1 2 3 1 2 3 1

k) 1 2 3 4 5 1 2 3 4 5 1 2 3

l) 9 9 7 7 9 9 7 7 9 9 7

m) 

n) A B C A B C A B C A B

BONUS

o) 







p) A B A A B A A B A A



q) 

r) 2 1 2 2 1 2 2 1 2

2. Draw a repeating pattern of your own.  
Ask another student to identify the core of your pattern.

3. Circle the core of the pattern. Then continue the pattern.

a)       \_\_\_\_\_

b)       \_\_\_\_\_

c) A B C A B C A \_\_\_\_\_







d) 2 7 9 5 2 7 9 5 \_\_\_\_\_








e) 2 0 0 1 2 0 0 1 \_\_\_\_\_

f) 1 5 1 1 5 1 1 5 1 1 5 \_\_\_\_\_

g) A B B A A B B A \_\_\_\_\_

h) 1 2 2 2 1 1 2 2 2 1 1 2 2 \_\_\_\_\_

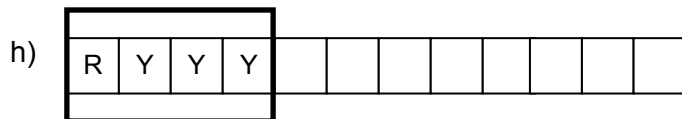
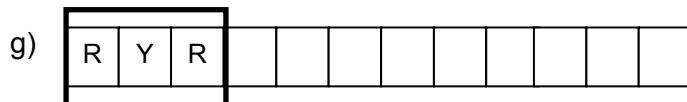
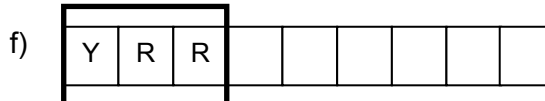
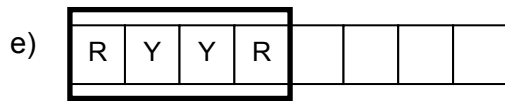
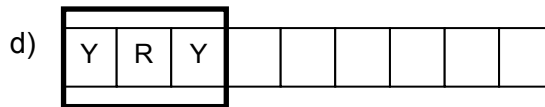
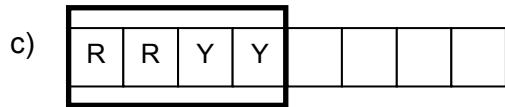
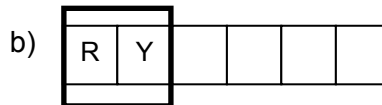
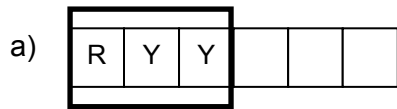
i)       \_\_\_\_\_

j)        \_\_\_\_\_

k)          \_\_\_\_\_

# PA3-11: Extending Repeating Patterns

1. The box shows the core of the pattern Karen made with red (R) and yellow (Y) blocks. Continue her pattern.

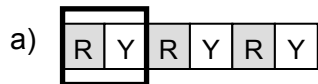


2. The core of Rachel's pattern is in the rectangle.

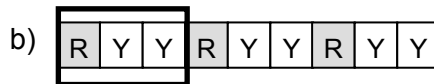
Stan tried to continue the pattern.

Did he continue the pattern correctly?

**HINT: Shade the reds if it helps.**



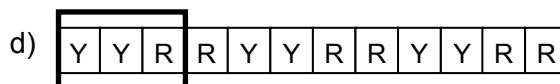
YES NO



YES NO



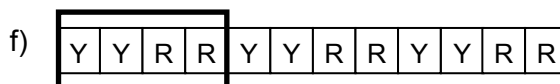
YES NO



YES NO



YES NO



YES NO

1. Are the blocks in the rectangle the core of the pattern?



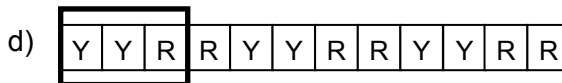
YES NO



YES NO



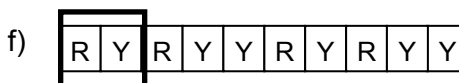
YES NO



YES NO

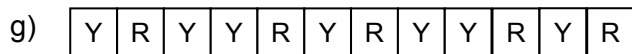
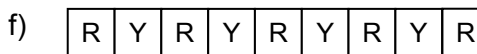
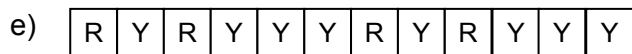
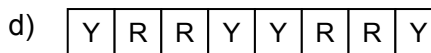
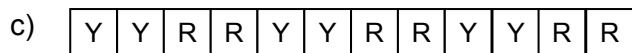
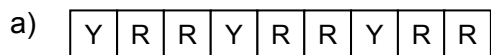


YES NO

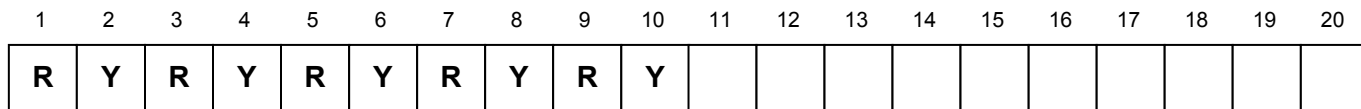


YES NO

2. Put a rectangle around the blocks that make up the core.



3. Continue the pattern below to show 20 blocks altogether.



a) What colour are the following blocks?

i) block 12

ii) block 14

iii) block 15

iv) block 18





b) What colour are the blocks of the even numbers (2, 4, 6, 8, ...)? \_\_\_\_\_

c) If you continued the pattern, what colour would the following blocks be?

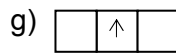
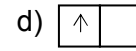
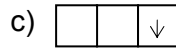
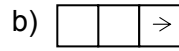
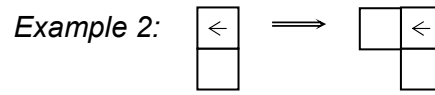
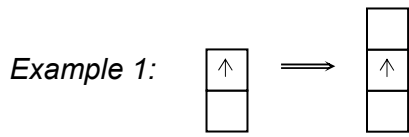
i) block 22

ii) block 27

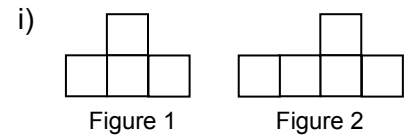
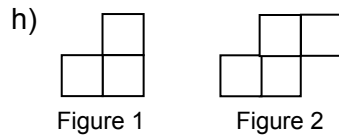
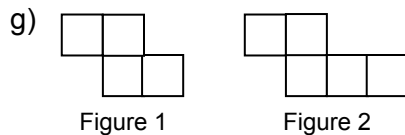
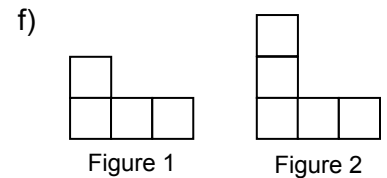
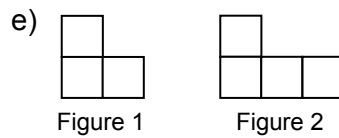
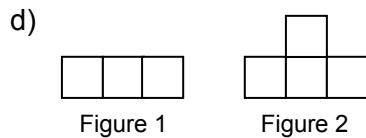
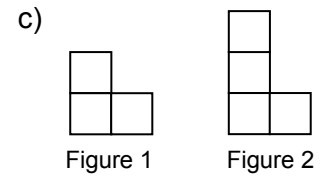
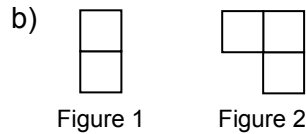
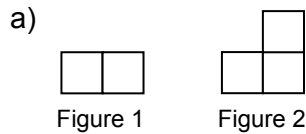
iii) block 35

iv) block 44

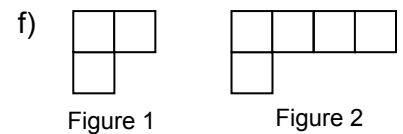
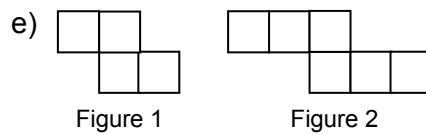
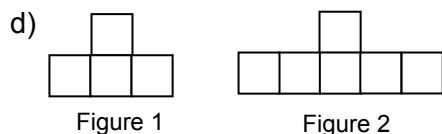
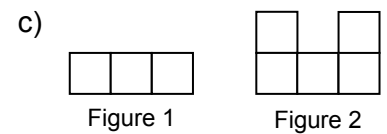
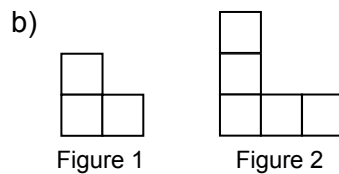
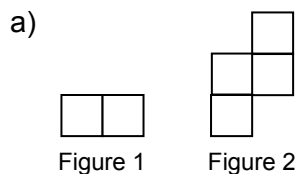
1. Add a square to the figure (along the edge shown by the arrow).



2. Shade the square that was added to Figure 1 to make Figure 2.



3. Shade the two squares that were added to Figure 1 to make Figure 2.



4. Shade any squares that were added to make the next figure in the pattern.

a)

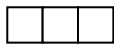


Figure 1

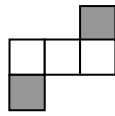


Figure 2

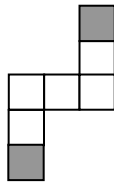


Figure 3

b)

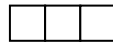


Figure 1

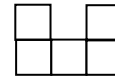


Figure 2

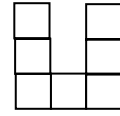


Figure 3

c)

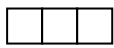


Figure 1

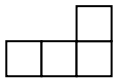


Figure 2

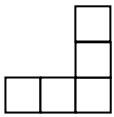


Figure 3

d)



Figure 1

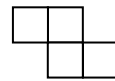


Figure 2

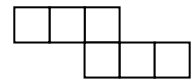


Figure 3

5. Shade any squares that were added to make the next figure. Then draw Figure 4 in the box provided.

a)



Figure 1



Figure 2

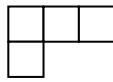


Figure 3

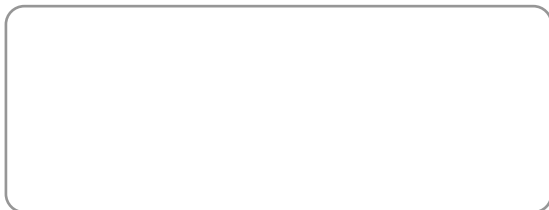


Figure 4

b)

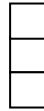


Figure 1

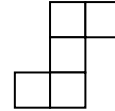


Figure 2

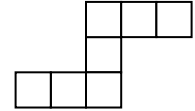


Figure 3



Figure 4

c)

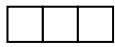


Figure 1

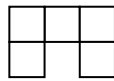


Figure 2

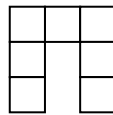


Figure 3



Figure 4

d)



Figure 1

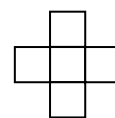


Figure 2

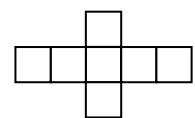


Figure 3

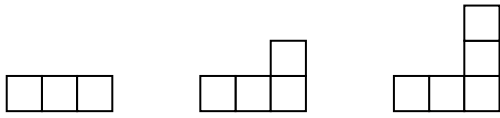


Figure 4

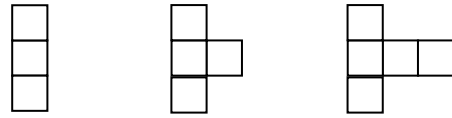
# PA3-14: Making Patterns with Squares (Advanced)

1. Draw the next figure (or build it using blocks).

a)



b)

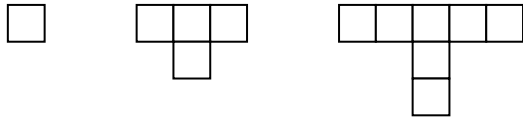


## BONUS

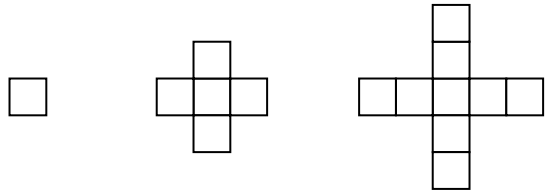
2. In the figures below, shade the squares that were added each time.

For an extra challenge draw the next figure on grid paper (or build it with blocks).

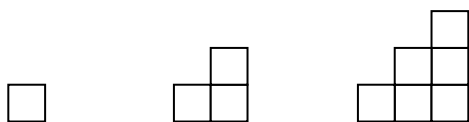
a)



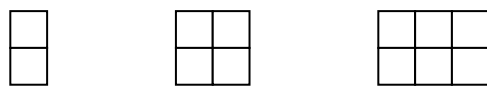
b)



c)



d)



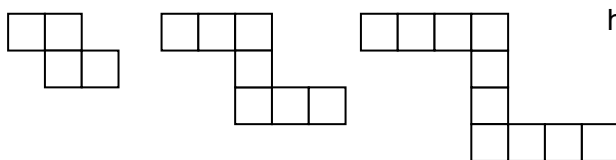
e)



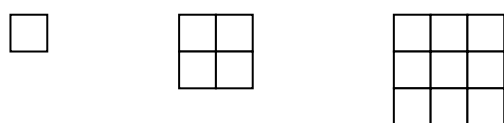
f)



g)



h)



# PA3-15: Extending a Pattern Using a Rule

1. Continue the following sequences by adding the number given.

a) (add 3) 30, 33, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_      b) (add 5) 60, 65, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

c) (add 2) 26, 28, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_      d) (add 10) 20, 30, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

e) (add 3) 12, 15, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_      f) (add 5) 46, 51, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

g) (add 5) 105, 110, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_      h) (add 5) 4, 9, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

2. Continue the following sequences, subtracting by the number given.

a) (subtract 2) 12, 10, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_      b) (subtract 3) 18, 15, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

c) (subtract 5) 55, 50, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_      d) (subtract 3) 63, 60, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

e) (subtract 2) 88, 86, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_      f) (subtract 5) 79, 74, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

g) (subtract 3) 30, 27, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_      h) (subtract 5) 200, 195, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

## BONUS

3. Which of the following sequences were made by adding 3? Circle them.

**HINT: Check all the numbers in the sequence.**

a) 3, 7, 9, 11

b) 3, 6, 9, 11

c) 3, 6, 9, 12

d) 19, 22, 25, 28

e) 15, 18, 21, 24

f) 18, 21, 24, 29

4. **2, 6, 10, 14 ...**

Ann says the above pattern was made by adding 4 each time. Is she right? Explain how you know.

---

---

5. Continue the following sequences by adding the number given.

a) (add 4) 30, 34, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_      b) (add 9) 11, 20, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

c) (add 6) 10, 16, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_      d) (add 7) 70, 77, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

e) (add 11) 10, 21, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_      f) (add 4) 56, 60, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

g) (add 8) 73, 81, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_      h) (add 10) 71, 81, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

6. Continue the following sequences by subtracting the number given.

a) (subtract 4) 45, 41, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_      b) (subtract 7) 48, 41, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

c) (subtract 3) 92, 89, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_      d) (subtract 8) 142, 134, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

e) (subtract 5) 230, 225, \_\_\_\_\_, \_\_\_\_\_      f) (subtract 5) 565, 560, \_\_\_\_\_, \_\_\_\_\_

g) (subtract 6) 366, 360, \_\_\_\_\_, \_\_\_\_\_      h) (subtract 10) 423, 413, \_\_\_\_\_, \_\_\_\_\_

**BONUS**

7. Create a pattern of your own. Write your pattern in the blanks. Then give the rule you used.

\_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_      My rule: \_\_\_\_\_

8. **67, 59, 51, 43, 35 ...**

Tariq says this sequence was made by subtracting 9 each time. Sharon says it was made by subtracting 8. Who is right?

---

---

# PA3-16: Identifying Pattern Rules

1. The following sequences were made by adding a number repeatedly. In each case, say what number was added.

- |                       |           |                   |           |
|-----------------------|-----------|-------------------|-----------|
| a) 2, 4, 6, 8         | add _____ | b) 3, 6, 9, 12    | add _____ |
| c) 15, 18, 21, 24     | add _____ | d) 42, 44, 46, 48 | add _____ |
| e) 41, 46, 51, 56     | add _____ | f) 19, 23, 27, 31 | add _____ |
| g) 243, 245, 247, 249 | add _____ | h) 21, 27, 33, 39 | add _____ |

2. The following sequences were made by subtracting a number repeatedly. In each case, say what number was subtracted.

- |                       |                |                    |                |
|-----------------------|----------------|--------------------|----------------|
| a) 16, 14, 12, 10     | subtract _____ | b) 30, 25, 20, 15  | subtract _____ |
| c) 100, 99, 98, 97    | subtract _____ | d) 42, 39, 36, 33  | subtract _____ |
| e) 17, 14, 11, 8      | subtract _____ | f) 99, 97, 95, 93  | subtract _____ |
| g) 190, 180, 170, 160 | subtract _____ | h) 100, 95, 90, 85 | subtract _____ |

3. State the rule for the following patterns.

- |                          |                |                         |           |
|--------------------------|----------------|-------------------------|-----------|
| a) 117, 110, 103, 96, 89 | subtract _____ | b) 1, 9, 17, 25, 33, 41 | add _____ |
| c) 101, 105, 109, 113    | _____          | d) 99, 88, 77, 66       | _____     |

## BONUS

4. Continue the pattern by filling in the blanks. Then write a rule for the pattern.

13, 18, 23, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_      The rule is: \_\_\_\_\_



5. **5, 8, 11, 14, 17 ...**

Keith says the pattern rule is: "Start at 5 and subtract 3 each time."

Jane says the rule is: "Add 4 each time."

Molly says the rule is: "Start at 5 and add 3 each time."

- a) Whose rule is correct?
- b) What mistakes did the others make? Explain.

# PA3-17: Introduction to T-tables

Abdul makes a **growing** pattern with squares. He records the number of squares in each figure in a T-table. He also records the number of squares he adds each time he makes a new figure.

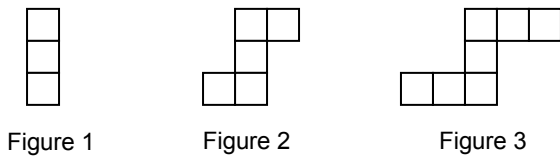


Figure	# of Squares
1	3
2	5
3	7

2 ← Number of squares added each time  
2 ←

The number of squares in the figures are 3, 5, 7, ...  
Abdul writes a rule for this number pattern.

**RULE: Start at 3 and add 2 each time.**

1. Abdul makes another growing pattern with squares. How many squares does he add to make each new figure? Write your answer in the circles provided. Then write a rule for the pattern.

a)

Figure	Number of Squares
1	4
2	7
3	10

○  
○

Rule:

b)

Figure	Number of Squares
1	2
2	5
3	8

○  
○

Rule:

c)

Figure	Number of Squares
1	4
2	6
3	8

○  
○

Rule:

d)

Figure	Number of Squares
1	1
2	5
3	9

○  
○

Rule:

e)

Figure	Number of Squares
1	5
2	7
3	9

○  
○

Rule:

f)

Figure	Number of Squares
1	6
2	12
3	18

○  
○

Rule:

g)

Figure	Number of Squares
1	2
2	8
3	14

Rule:

h)

Figure	Number of Squares
1	3
2	6
3	9

Rule:

i)

Figure	Number of Squares
1	5
2	12
3	19

Rule:

**BONUS**

2. Extend the number pattern. How many squares would be used in Figure 6?

a)

Figure	Number of Squares
1	2
2	5
3	8
4	
5	
6	

b)

Figure	Number of Squares
1	6
2	9
3	12

c)

Figure	Number of Squares
1	1
2	6
3	11

d)

Figure	Number of Squares
1	4
2	9
3	14

e)

Figure	Number of Squares
1	10
2	13
3	16

f)

Figure	Number of Squares
1	12
2	16
3	20



3. Make a T-table and record the number of squares or circles in each figure. Write a rule for the pattern.

a)

b)

4. Amy makes a growing pattern with squares. After making Figure 3, she only has 14 squares left. Does she have enough squares to complete Figure 4?

a)

Figure	Number of Squares
1	4
2	7
3	10

YES NO

b)

Figure	Number of Squares
1	6
2	9
3	12

YES NO

c)

Figure	Number of Squares
1	1
2	6
3	11

YES NO

5. Extend the pattern to find out how many eggs 5 birds would lay.



a)

Bald Eagle	Number of Eggs
1	2
2	4
3	
4	
5	

b)

Sand-piper	Number of Eggs
1	4
2	8

c)

Snow Goose	Number of Eggs
1	3
2	6

d)

Marsh Hawk	Number of Eggs
1	5
2	10

6. How many young would 5 animals have?

a)

Polar Bear	Number of Cubs
1	2
2	4

b)

Swift Fox	Number of Pups
1	4
2	8

c)

Bearded Seal	Number of Pups
1	5
2	10

d)

Coyote	Number of Cubs
1	6
2	12

7. How much money would Alice earn for 4 hours of work?

a)

Hours Worked	Dollars Earned in an Hour
1	\$7

b)

Hours Worked	Dollars Earned in an Hour
1	\$8

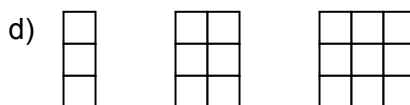
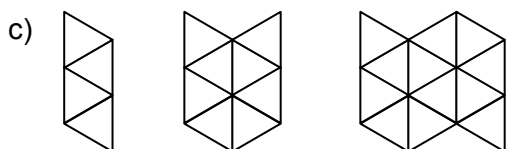
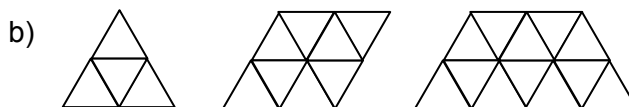
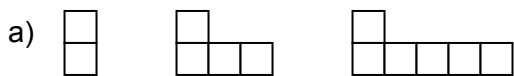
c)

Hours Worked	Dollars Earned in an Hour
1	\$6



Answer the following questions in your notebook.

1. How many squares or triangles would be used for Figure 6? Explain how you know.



2. Priya makes a sequence of Ls with nickels.

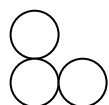


Figure 1

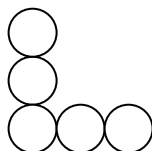


Figure 2

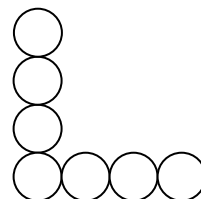
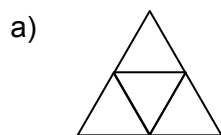


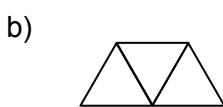
Figure 3

- a) How many nickels will be in Figure 5?
- b) What is the value of the coins in Figure 5?

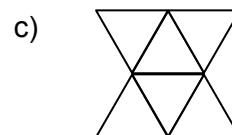
3. Indra makes broaches with triangles. She has 16 triangles. Does she have enough triangles to make 5 broaches if there are ...



4 triangles in each broach?



3 triangles in each broach?



6 triangles in each broach?

d) Explain how you know the answer for part a).

**BONUS**

4. The even numbers (greater than 0) are the numbers you say when counting by 2s:

**2, 4, 6, 8, 10, 12, 14 ...**

Predict whether the number of squares in Figure 10 in Question 1 d) above will be even or not.

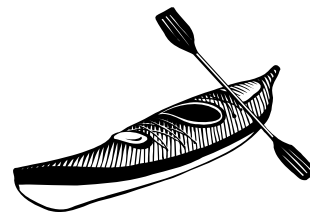


Answer the following questions in your notebook.

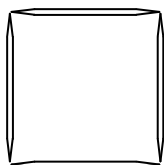
1. Bill saves \$6 each month.
  - a) How much he will save in 3 months?
  - b) How many months will it take him to save \$30?

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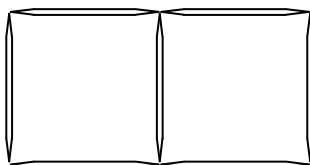
2. It costs \$5 to rent a kayak for the first hour.  
It costs \$4 for each hour after that.
  - a) How much does it cost to rent the kayak for 4 hours?
  - b) Sandra has \$26. Can she rent the kayak for 6 hours?



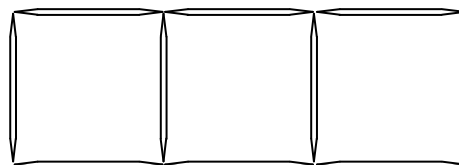
3. Karla has 20 toothpicks.  
Can she make a design with 6 squares?  
Explain how you know.



Step 1

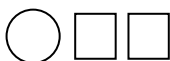


Step 2

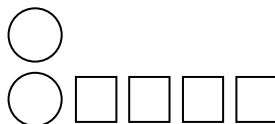


Step 3

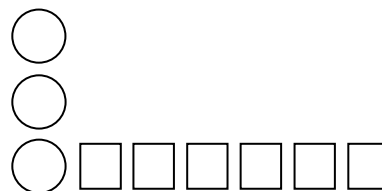
4. How many squares and circles would be in Design E?



Design A



Design B



Design C

5. Each pattern was made by adding a number repeatedly.  
Find the mistake and correct it.
  - a) 5, 8, 9, 11, 13
  - b) 7, 10, 13, 15, 19

6. Find an increasing pattern and a repeating pattern in your classroom.