Names (pair) _____ Date _____

Constant Change

Example

A candle is 24 cm tall and burns down 2 cm every hour.

t	0	1	2	3	4
h	24	22	20	18	16
change		-2	-2	-2	-2

When t goes up by 1, the height **always** goes down by 2. The change is constant: the relationship is **linear**.

Remember

If, for **equal steps** in x, the value of y always changes by the **same amount**, the relationship is **linear** and the points lie on a line. When the steps in x are not equal, compare the change per step of 1.

1 IN PAIRS Fill in the changes. Is the change constant? Watch the steps in x in tables E and F.

A

x	0	1	2	3	4
y	5	8	11	14	17
change		☐	☐	☐	☐

linear? **yes** / **no**

B

x	0	1	2	3	4
y	1	2	4	8	16
change		☐	☐	☐	☐

linear? **yes** / **no**

C

x	0	1	2	3	4
y	10	7	4	1	-2
change		☐	☐	☐	☐

linear? **yes** / **no**

D

x	1	2	3	4	5
y	1	4	9	16	25
change		☐	☐	☐	☐

linear? **yes** / **no**

E

x	0	2	4	6	8
y	3	4	5	6	7
change		☐	☐	☐	☐

linear? **yes** / **no**

F

x	0	1	3	4	6
y	2	4	8	10	14
change		☐	☐	☐	☐

linear? **yes** / **no**

Names (pair) _____ Date _____

2 IN PAIRS Is the relationship linear? Circle.

a) the taxi fare (3 € to start and 1.20 € per km) against the number of km **yes** / **no**

b) the area of a square against its side length **yes** / **no**

c) savings (100 € and another 20 € every month) against the number of months **yes** / **no**

d) the number of bacteria, doubling every hour, against time **yes** / **no**

e) the perimeter of a square against its side length **yes** / **no**

3 ON YOUR OWN The pattern grows. Complete the table. How many squares does figure 10 have?

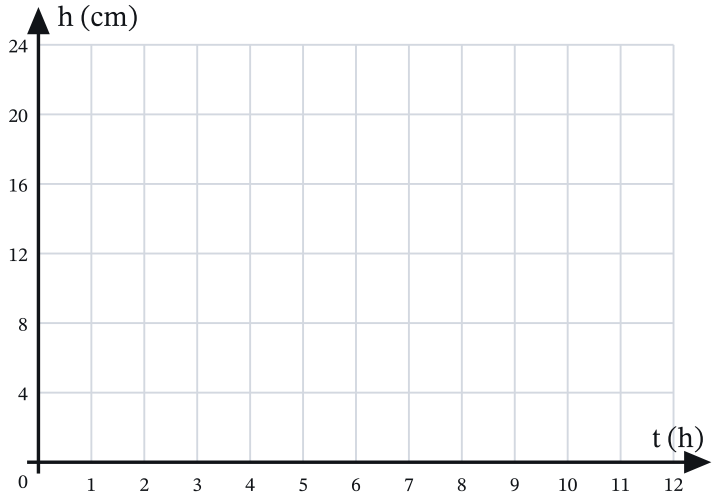


figure 1 figure 2 figure 3

n	1	2	3	4	10
number	☐	☐	☐	☐	☐
change		☐	☐	☐	☐

number of squares = ☐ · n + ☐

4 ON YOUR OWN Plot the points from the candle example. Do they lie on a line? When will the candle burn out?



The candle burns out after ☐ h.

The Growing Patterns app · otooly.com/growing-patterns

Build the pattern from task 3 and check the number of squares for larger figures.

★ ON YOUR OWN **Exit card.** Is the table x: 0, 1, 2, 3; y: 7, 4, 1, −2 linear? **yes** / **no** Change: ☐