CGP Education

INTEGERS INTRO :

Zero Pairs

Zero Pairs

Lots of math involves adding and subtracting with positive and negative numbers.

Positive and negative numbers “cancel each other out” — for example, if you add the numbers 1 and –1, you get zero.

You can use this fact to add and subtract other numbers too.

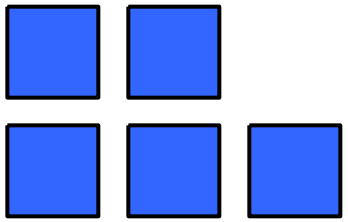
Zero Pairs

You can represent positive and negative integers using blue and red tiles.

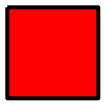
Each **blue tile** represents **1**.


= 1

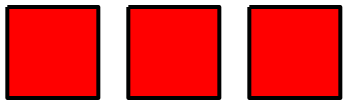
So the number **5** would be shown using **5 blue tiles**.


5

Each **red tile** represents **–1**.

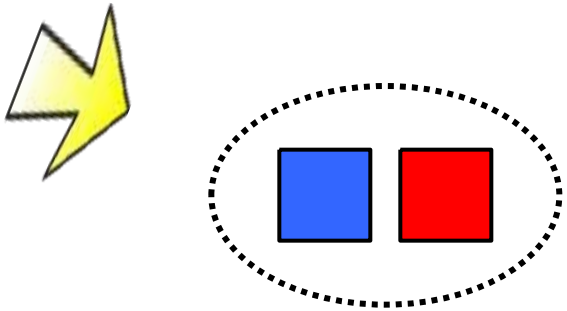

= –1

So the number **–3** would be shown using **3 red tiles**.


–3

Zero Pairs

A red and a blue tile together make **zero**.
This is called a **zero pair**.



1 + (–1) = 0

Because zero pairs have a **value** of **zero**, they **do not affect** the value of other groups of tiles.

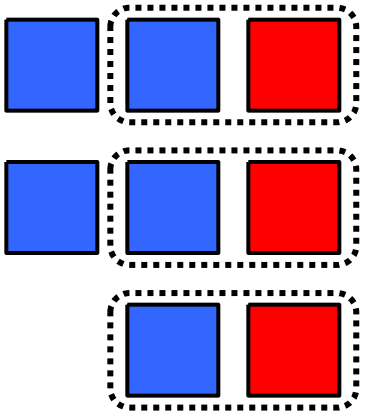
Zero Pairs

Example

Add 5 + (–3) with integer tiles.

Solution

5 + (–3)



Take **5 blue tiles**, and add **3 red tiles**.

You can remove the zero pairs.

This leaves **2 blue tiles**.

So **5 + (–3) = 2**.

Solution follows…

Zero Pairs

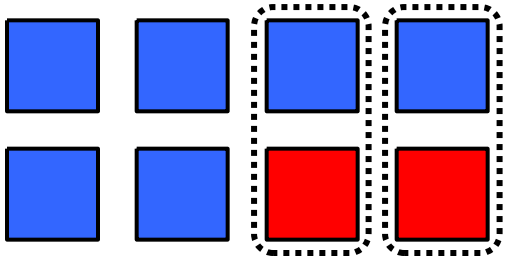
Example

Subtract 4 – (–2) with integer tiles.

Solution

Take **4 blue tiles**.

To **subtract –2**, you need to **remove 2 red tiles**. But there are no red tiles.



The total value of the tiles is still 4.

However, you can **add two zero pairs** — zero pairs **do not change** anything.

Now you can **remove 2 red tiles**.

This leaves **6 blue tiles**. So **4 – (–2) = 6**.

Solution follows…

Zero Pairs

Exercises

1. Use integer tiles to model and solve each of the following:

a. –6 + 5 = –1

b. –2 + (–7) = –9

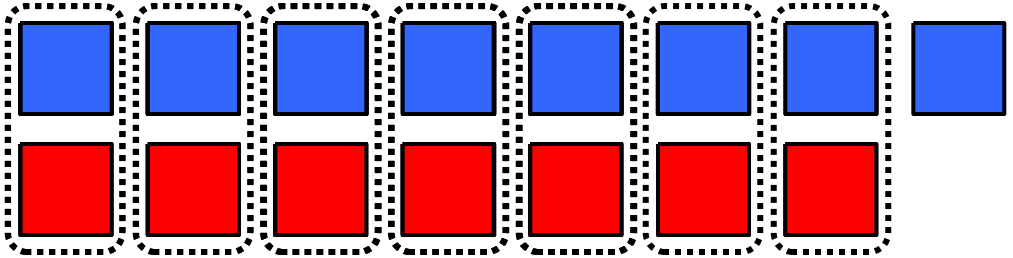
c. 8 + (–3) = 5

d. 5 – 7 = –2

e. –3 – 2 = –5

f. 2 – (–3) = 5

d.



Start with 2 blue tiles

Add 5 red tiles

Remove 5 blue tiles

This leaves 2 red tiles

Solution follows…

Zero Pairs

Exercises

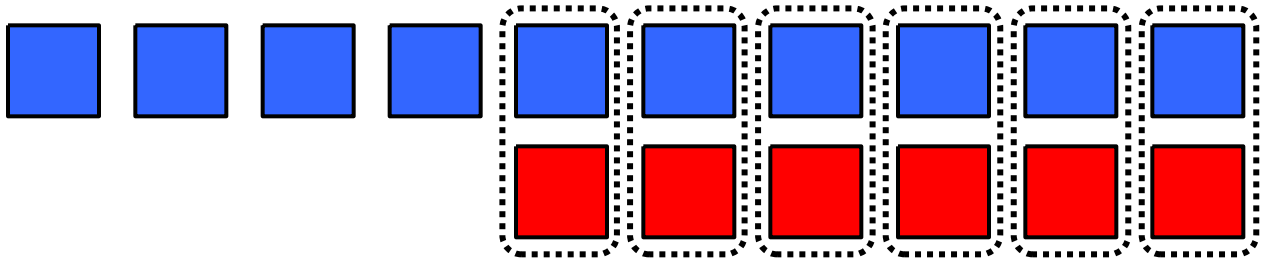
2. How can **4 – (–6)** be solved using red and blue tiles? Show how removing 6 red tiles has the same effect as adding 6 blue tiles.

Start with 4 blue tiles

Add 6 zero pairs

Remove 6 red tiles

This leaves 10 blue tiles

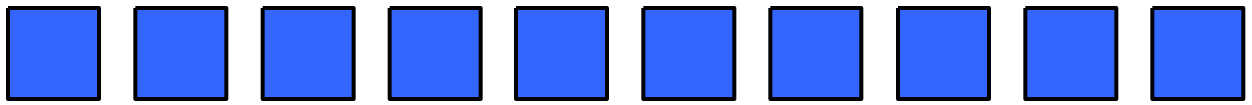


This has the same effect as adding 6 blue tiles:

Start with 4 blue tiles

Add 6 blue tiles

This also leaves 10 blue tiles



Solution follows…

Zero Pairs

Round Up

You can use tiles to represent lots of **addition** and **subtraction** problems.

To do an **addition**, you need to **add tiles**.

To do a **subtraction**, you need to **remove tiles**.

But remember, you can always **add or remove a zero pair** without affecting anything.