# Negative Numbers

Aim: Count forwards and backwards past zero into negative numbers. Solve problems using negative numbers and give reasons for answers.

## Denis the Delivery Man

Denis has six parcels to deliver in a block of flats. The deliveries need to be made in a certain order depending on when people are at home. The flats have floors above and below ground level. As Denis delivers the parcels, write what he delivers at the floors he visits in the order that he makes the deliveries. Remember to use the negative value to mark the basement floors.

Floor _____ Order _____ Parcel _____

**Floor 4**

Floor _____ Order _____ Parcel _____

Floor _____ Order _____ Parcel _____

Floor _____ Order _____ Parcel _____

**Floor 0**

Floor _____ Order _____ Parcel _____

Floor _____ Order _____ Parcel _____

Floor _____ Order _____ Parcel _____

Floor _____ Order _____ Parcel _____

**Floor -5**

1.  Denis starts on the ground floor (0) and his first delivery is a cake on floor 2.

2.  He then goes down 4 floors to deliver a book.

3.  Denis has to go down another 2 floors next to deliver a hat.

4.  Once that parcel is delivered, he travels up 9 floors to deliver a CD.

5.  After that, Denis goes down to basement level -1 to deliver a lamp.
    How many floors has he travelled to get there? _____

6.  Up he goes again. This time 4 floors up to deliver some
    paint. Mark which floor he is at now.

7.  Denis has done his last delivery. How many floors must he travel to get
    back to the ground floor (0)? In which direction is he going? _____

## Challenge

Which floors has Denis not delivered to?

Denis finds another parcel in his bag. It does not have a floor number on it but it does give him a clue. It says 'Deliver me to the floor with the largest number'. Which floor does Denis need to go to? Explain how you know.

# Negative Numbers **Answers**

1. Cake on floor 2.

2. Book on floor -2.

3. Hat on floor -4.

4. CD on floor 5.

5. Lamp on floor -1 and -6 floors or 6 floors down.

6. Paint on floor 3.

7. 3 floors. He is going down.

**Challenge**
Denis hasn't delivered to floors -5, -3, 1, 4.


Denis needs to go to floor 4 because 5 is a bigger number that 4, but the floor is -5 (a negative number), so it has a smaller value than +4 (a positive number).

# Negative Numbers

Aim: Count forwards and backwards past zero into negative numbers. Solve problems using negative numbers and give reasons for answers.

## Denis the Delivery Man

Denis has 10 parcels to deliver in a block of flats. The deliveries need to be made in a certain order depending on when people are at home. The flats have floors above and below ground level. As Denis delivers the parcels, mark the floors he visits in the order that he makes the deliveries. Remember to use the negative value to mark the basement floors.

Floor _____ Order _____

Floor _____ Order _____

Floor _____ Order _____

**Floor 3**

Floor _____ Order _____

Floor _____ Order _____

**Floor 0**

Floor _____ Order _____

Floor _____ Order _____

Floor _____ Order _____

Floor _____ Order _____

Floor _____ Order _____

**Floor -6**

1. Denis starts on the ground floor (0) and his first delivery is on floor 2.

2. He then goes down 4 floors.

3. Denis has to go down another 3 floors next.

4. Once that parcel is delivered, he travels up 10 floors.

5. After that, Denis goes down to basement level -1.
   How many floors has he travelled to get there? _____

6. Up he goes again. This time 5 floors up. Mark which floor he is at now.

7. Back down 7 floors. Where is he now? _____

8. Up to floor 1 next. How many floors has Denis gone up this time? _____

9. Finally, back down 5 floors.

10. Where is Denis' last delivery? _____ How many floors must he travel to get there? _____ In which direction is he going? _____

## Challenge

If he starts and finishes his round at ground level (Floor 0), how many floors has Denis stopped at or travelled past on his delivery round today? _____

Denis thinks he could have done his round travelling to fewer floors. Do you agree? Give reasons for your answer.

_____

_____

_____

# Negative Numbers **Answers**

1. Floor

2. Floor -2.

3. Floor -5.

4. Floor 5.

5. Floor -1 and -6 floors or 6 floors down.

6. Floor 4.

7. Floor -3.

8. Floor 1 and +4 floors or 4 floors up.

9. Floor -4.

10. Floor 6 and 10 floors. He is going up.

**Challenge**

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If Denis started at the ground floor and went up in order to the floors he had parcels for he would go to floors 1, 2, 4, 5 and 6, stopping or passing 6 floors. If he then went down to basement floor -5 he would travel past 11 floors. If he then delivered to floors -4, -3, -2, -1, and finished back on the ground floor he would have visited another 5 floors.

6+11+5= 22 floors.

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Aim: Count forwards and backwards past zero into negative numbers. Solve problems using negative numbers and give reasons for answers.

## Denis the Delivery Man

Denis has 10 parcels to deliver in a block of flats. The deliveries need to be made in a certain order depending on when people are at home. The flats have floors above and below ground level. The lift only stops at even numbered floors and Denis has to use the stairs to the odd numbered floors.

| | |
|---|---|
| | Floor _____ Order _____ |
| | Floor _____ Order _____ |
| | Floor _____ Order _____ |
| | Floor _____ Order _____ |
| | Floor _____ Order _____ |
| | Floor _____ Order _____ |
| | Floor _____ Order _____ |
| | **Floor 3** |
| | Floor _____ Order _____ |
| | Floor _____ Order _____ |
| | **Floor 0** |
| | Floor _____ Order _____ |
| | Floor _____ Order _____ |
| | Floor _____ Order _____ |
| | Floor _____ Order _____ |
| | Floor _____ Order _____ |
| | **Floor -6** |
| | Floor _____ Order _____ |
| | Floor _____ Order _____ |
| | Floor _____ Order _____ |
| | Floor _____ Order _____ |

As Denis delivers the parcels, mark the floors he visits in the order that he makes the deliveries. Remember to use the negative value to mark the basement floors.

1. Denis starts his delivery at floor 7.

2. He then needs to travel down 10 floors. Where is he now? _____

3. Up he goes 7 floors for his next delivery.

4. He now delivers to basement floor -9. How far has he travelled? In which direction has he travelled? _____

5. He then climbs up 5 floors. Mark the floor on the scale.

6. For his next two deliveries, Denis must use the stairs for his first delivery; he must use the lift for the other journey. He wants to choose the journey with the least amount of stairs to walk. If he has a parcel for floor 6 and floor -10, which delivery must he go to using the lift? Explain your answer. _____

   _____

   _____

   _____

7. Denis has delivered 7 parcels now and he must go to reception on the ground floor to pick up his last three deliveries. How many floors must he travel? _____

8. Two parcels are for floor 5, the final parcel is for 12 floors below that. Where does Denis finish his deliveries? _____

9. How many floors must Denis travel by lift to get back to the ground floor? _____

10. How many floors has Denis not visited on his delivery round? _____

## Challenge

If Denis now has to start at the lowest floor and deliver parcels to every floor that he hasn't delivered parcels to, how many flights of stairs would he need to use? He must always be walking up the stairs. Show how you worked this out.

_____

_____

_____

_____

# Negative Numbers **Answers**

1. Floor 7.

2. Floor -3.

3. Floor 4.

4. Floor -9 is 13 floors down.

5. Floor -4

6. Floor -4 to -10 is 6 floors by stair. Then, floor -10 to 6 is 16 floors by lift.

7. Floor -4 to 6 is 10 floors by stair. Then floor 6 to floor -10 is 16 floors by lift.

8. Denis should use the stairs to floor -10, then lift to floor 6.

9. Reception is 6 floors down.

10. Denis finishes on basement floor -7.

11. He must travel either 8 or 6 floors by lift as there is no lift on floor -7.

12. Denis has not visited 11 of the floors in the building.

**Challenge**

The floors that he needs to use the stairs for are the odd numbered floors.

These are; -5, -1, 1, 3 and 9. Denis needs to use the stairs to deliver to 5 floors so he needs to use 10 flights of stairs (a flight to get from the lift to the odd numbered floor, then another flight from the odd numbered floor back to the lift.)

This could be shown in a table below, or reasoned.

| Stairs from | Stairs to |
|---|---|
| -6 | -5 |
| -5 | -4 (lift) |
| -2 | -1 |
| -1 | 0 |
| 0 | 1 |
| 1 | 2 |
| 2 | 3 |
| 3 | 4 (lift) |
| 8 | 9 |
| 9 | 10 (lift) |